

p. 260

32



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THE
ZOOLOGIST:
A
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OF
NATURAL HISTORY.

CONDUCTED BY
EDWARD NEWMAN, F.L.S., F.Z.S.,
MEMB. IMP. L.-C. ACAD.

SECOND SERIES.—VOLUME THE NINTH.
(OR THIRTY-SECOND FROM THE COMMENCEMENT.)



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M.DCCC.LXXIV.

Birds and Beasts,
And the mute Fish that glances in the stream,
And harmless Reptile coiling in the sun,
And gorgeous Insect hovering in the air,
The Fowl domestic, and the household Dog,
In his capacious mind—he loved them all.

WORDSWORTH.

Gem, flower and fish, the bird, the brute,
Of every kind occult or known,
Each exquisitely formed to suit
Its humble lot, and that alone,
Through ocean, earth, and air fulfil,
Unconsciously, their Maker's will.

A man may never aim at being anything more than a mere observer, and yet employ his time usefully to others as well as agreeably to himself. He may restrict himself to simply noting and recording what falls under his own *autopsia*, and unconsciously be laying the foundation of the most important generalization. For observation, though not itself the true end of the science of Natural History, is nevertheless a means to that end; and, whatever principles we ultimately arrive at, it is only observation that can have insured their correctness or permanence.—LEONARD JENYNS.

Niebuhr reckoned it among the most important results of his travels, that the indifference with which he was in the habit of regarding the objects of Nature around him had given way; and any who will educate themselves to observe, will find that Niebuhr made no error in the reckoning. The senses are not given to man with the limited powers they have in brutes. They have eyes, but they, in one sense, see not: whereas in us, the eye is, besides the visual organ, a sentinel and servant to watch and go forth, and bid welcome, the messenger which the Creator sends to man in the presence of his works; and to introduce these messengers into the inner chambers, where the soul may hold fit converse and contemplation with them.—Dr. GEORGE JOHNSTON.

PREFACE.

WHEN I look at the Title-page of this Volume, and find that it is the THIRTY-SECOND,—and that I have been Thirty-two years engaged on the 'ZOOLOGIST,' and have retained many of my best contributors and kindest friends during that long, long period,—I feel that I have abundant cause for gratitude to those who have been so steadfast and so obliging. I think I may say, without hesitation, that no other Natural-History Journal ever attained to so green and vigorous an old age.

This feeling of happiness in the co-operation of my friends is, alas, clouded, in a measure, by the loss of one of the most constant and kindest of them all. Francis Walker—from the very beginning a contributor, a subscriber, and a supporter—never once during that long period relaxed his efforts to advance the cause of Science, as advocated in the 'ZOOLOGIST;' his kindness never abated; his friendship never cooled: I cannot expect to meet with his like again. He died at his residence, Elm Hall, Wanstead, on the 5th of October, in perfect peace with all the world, peace of body and of mind; I never heard from his lips a single unkind expression, nor do I believe he ever entertained, even for a moment, an unkind thought.

Passing to the Contents of this year's 'ZOOLOGIST' I am gratified to see an increasing disposition to observe the living animal. The preserved remains have heretofore engaged too exclusively the attention of the scientific; but a change is evidently taking place; and it is pleasing to believe that the 'ZOOLOGIST' has been mainly instrumental in inaugurating that change. I will give a few illustrations of this: facts now for the first time brought to notice.

Sucklers.—Until published during the present year (p. 3877) I have seen no mention of the very curious fact that the Seal swims on its back, reversing the position on land or on the ice; for the obvious reason, that when out of water it is compelled to be constantly on the look out for enemies above it, and in the water for food, which is below it: the fixed position of the eyes requiring the position of the body to be reversed according to each requirement.

Birds.—At p. 4118 Mr. Wallis, a new and most promising observer, has described "how the Puffin ascends to its nest," throwing an entirely new light on that interesting question; and on the following page the subaqueous flight of the Guillemot is described also for the

first time. The purchase of a Penguin by the Zoological Society has afforded the rare opportunity of watching its subaqueous proceedings (p. 4262), which have proved most interesting. At p. 4197 will be found a brief account of the nesting of the Crowned Pigeon, showing a strange discrepancy between the economy of this and the other species of the same order: the young of the Crowned Pigeon being about one-third the size of the adult when it leaves the nest; the Domestic Pigeon being full grown; and both being fully feathered. At p. 3998 is an extremely interesting, and I believe quite original, observation, by Mr. Barrington, on the position in which the Tree Creeper holds its legs when climbing a vertical trunk.

Fishes.—I would emphatically call attention to the observation of Mr. Hughes (p. 3895) on the sleep of Fishes: the enquiry whether Fishes sleep has been repeated over and over again; and to Mr. Hughes is due the credit of giving a satisfactory reply:—Fishes not only sleep, but sleep soundly, lying perfectly still at the bottom of little rock-pools left by the retiring tide; and in the instance recorded allowing Mr. Hughes to take them, one by one, out of the water, while they still continued slumbering unconscious of danger. At p. 3872 I have reprinted from ‘Nature’ a paper by Mr. Saville-Kent, intitled, “Fish distinguished by their Actions.” Mr. Kent was kind enough to send me this for republication, knowing the extreme interest I took in the doings of all living animals. The Fishes principally noticed are the Smooth Hound, the Spotted Dog-fish, the Angel-fish, the Gurnards, the Gemmeous Dragonets, the Pipe-fish, the Sea-horses, and the John Dorée, concerning all of which he has made original observations. Again at p. 3838 Mr. Howard Saunders has, I believe, for the first time, recorded the spawning habits of the Flying Fish, as observed by himself at the Chincha Islands, on the coast of Peru.

Crustaceans.—The capture of the American King Crab, or Horse-shoe Crab, off the coast of Holland, as recorded in the ‘ZOOLOGIST’ last year, was regarded as a problem extremely difficult of solution; but in the January number of this year (p. 3845) Mr. Lloyd informed us that, when manager of the Hamburg Aquarium, having received a greater quantity of King Crabs than he could possibly accommodate, he packed them in a cask, shipped them on board a steamer bound for London, and had them thrown into the sea on the British side of the little island of Heligoland. This was in August, 1866; and there is no reason to doubt that either these very Crabs or their descendants were captured on the same spot in 1874.

Such are some of the results obtained already by diverting observation into a channel comparatively new.

EDWARD NEWMAN.

CONTENTS.

ALPHABETICAL LIST OF CONTRIBUTORS.

BAILEY, H. F.

Ostriches pairing, 3916

BALKWILL, FRANCIS HANCOCK

Curious malformation of the incisor teeth in the skulls of two rats, 3935

BALL, RICHARD

Affection of the sea gull for its young, 4201

BARCLAY, H. A.

Hoopoe at Knotts Green, Leyton, 4035

BARRINGTON, RICHARD M.

Siskins breeding in Ireland, 3914; Golden eagle at Powerscourt, 3952; Peculiar position in feet of *Certhia familiaris*, 3998; The hairy-armed bat (*Scotophilus Leisleri*) in Ireland, 4071; Migrations of spring immigrants, 4100

BELL, THOMAS, F.R.S.

Scarcity and late stay of martins and swallows at Selborne, 3833

BORRER, WILLIAM, F.L.S.

Notes on British bats, 4125

BOWERBANK, J. S., LL.D., F.R.S.

Fishing frog at St. Leonard's, 4000; Beaumaris shark taken off Hastings, 4201

BOYES, F.

Glaucous gulls in East Yorkshire, 3836; Little bittern in East Yorkshire, 4118

BRIGGS, T. R. ARCHER, F.L.S.

Autumnal song of the chiffchaff, 4238

BROWN, JOHN A. HARVIE

Osprey carrying off chickens, 4117; Glaucous gull, 4120

BRUNTON, T.

Birds observed at Glenarm Castle, 3829; Arrival of summer birds at Glenarm, 4032

BUTLER, A. G., F.L.S.

Robins feeding young thrushes, 4033; Starlings laying in the hole of a sand martin, 4077

CAMBRIDGE, Rev. O. P., M.A.

Fieldfares feeding upon apples, 3830; Late stay of house martins, 3833; Conclusion of the 'Entomologist's Annual,' 3955

CANE, T.

Great crested grebe at Luton, 3836

CAREY, C. B.

A word about museums, 4056; song of the swallow, 4156; Ornithological jottings, 4231; Cuckoo singing at night, 4238

CLARK-KENNEDY, Capt., F.R.G.S., &c.

Ornithology of the Orkneys, 3883; On the occurrence of *Emberiza nivalis* in full summer plumage, 3914

CLARK-KENNEDY, ARTHUR JOHN

An osprey carrying off young chickens, 3996; A flight of bats, Complaint in nestling birds, 4075; Iceland gull, 4078; Baillon's crake near Eastbourne, 4159; Gray phalarope in Cheshire, 4239; Rare birds at Eastbourne, 4258; Late breeding of partridges, 4260

CLOGG, STEPHEN

Black redstart in summer plumage in November, 3832; Martins and swallows—is their late stay dependent on the wind? Indifference of small birds to the kestrel, 3834; Greater forkbeard off Looe, Cornwall, 3839; Early congregation of martins, 4157; Salmon peal attacked by a garfish, 4160; Gray phalarope in Cornwall, 4239

COOKE, NICHOLAS

Eagle owl at Bridgnorth, 3997

CORBIN, G. B.

A four-legged chicken, 3835; Food of the salmon, 3839; Corn crake, 3881; The mute swan and its food, 3915; Lesser redpoll and siskin, 4034; Swallows roosting on rushes, 4035

CORDEAUX, JOHN

Ornithological notes from North Lincolnshire, 3856, 3942, 4029, 4059, 4224

CORNISH, THOMAS

Small lumpsucker, 3839; Lump-sucker and whiff off the Cornish coast, The species of mackerel, 4037; Fox shark off Scilly, Dorset near the Lizard, Cornwall, 4080; Turtle in Mount's Bay, 4242; Pimelepterus Cornubiensis, a supposed new fish, at Penzance, 4255; Ray's bream near Penzance, 4266

COUCH, JAMES

Birds in Guernsey, 4237; Mute swan in Guernsey, 4239

CREWE, Rev. H. HARPUR, M.A.

House martin near Aylesbury on the 5th of December, 3833

CROSFIELD, ALBERT J.

Late martins and swallows, 3881

DOCKRAY, JOHN A.

Curious nesting of the flycatcher, 4197

DOUBLEDAY, HENRY

Tree sparrow, 3997; Little bittern near Epping, 4199

DURNFORD HENRY

Note on the water rail, 3881; Ornithological notes from Lancashire, 3912; Malformation in upper mandible of a redshank, 3999; Ornithological notes, 4063; Notes on the birds of Walney Island, 4191

EATON, Rev. A. E., M.A.

Notes on the Fauna of Spitsbergen, 3805

EDSON, Mr.

Communications and extracts concerning the marsh sandpiper, 4054

FOSTER, J. A.

Curious instinct in the mole, 3879

FRYER, ALFRED

Bluetheated warbler at Chatteris, Cambridgeshire, 3953

GATCOMBE, JOHN

Ornithological notes from Devonshire, Cornwall, &c., 3826, 3909, 3943, 4102, 4226, 4253; Plumage of the black redstart, 3913; Piebald and malformed rat, 3996; An octopus at Plymouth, 4037; Rabbit with one ear, 4153; Greater shearwater on the coasts of Devon and Cornwall, 4262; Pilot-fish at Plymouth, 4266

GODLEE, RICKMAN J.

The bite of a viper, 4079

GROVES, H.

Clausilia Rolphii in Surrey, 4243

GUNN, T. E.

Buzzards in Norfolk, Marsh harrier in Suffolk, Food of barn owl and great spotted woodpecker, Pied flycatcher in Norfolk, Lesser redpoll breeding near Norwich, 4117

GURNEY, J. H.

Note on the longevity of the royal kite, 3830; Note on the occurrence of the greater shearwater in Bridlington Bay, 3882; Note on the changes of plumage in guillemots and razorbills, 3954; Water rail, 4036; Greater spotted woodpecker and starlings, 4077; Note on the voracity of a tame duck, 4078; Note on a pied lobster, 4080; Food of the noctule bat, 4153; Nidification of the snowy owl in confinement, 4154; Salmon in the River Coquet in the last century, 4160; Note on the noctule bat, Accident to a weasel and to a redbreast, 4194

GURNEY, J. H., jun.

Shore birds on the Cley and Blakeney muds, 4196

HADFIELD, Capt. HENRY

Remarks on birds seen during a three weeks' tour in Brittany, 3945; Fish and Crustacea in the tanks, &c., at Concarneau, 3947; Large otter in the Isle of Wight, 3952; Pairing of birds, 3954; Common buzzard in the Isle of Wight, 3996; Peregrines in the Isle of Wight, 4032; Nesting of the tree sparrow, 4076; Mortality of the house sparrow and martin, 4155; Little auk and dunlin, 4200; Autumnal migration of the willow wren, swallow and black-cap, 4259

- HART, W. E.
Partridge perching in a tree, 3834
- HODGKINSON, J. B.
Glossy ibis and roller, 4158
- HORNBY, HUGH P.
Cuckoo in confinement, 3833
- HÜGEL, Baron A. von
Ornithological notes from Torquay, 3906, 4065
- HUGHES, W. R., F.L.S.
The sleep of fishes, 3895
- JEFFERY, W., jun.
Ornithological notes from West Sussex, 3822; Food of water shrew, 3829
- JONES, J. MATTHEW, F.L.S.
A new fish, 3837
- KENT, W. SAVILLE, F.L.S.
Fish distinguished by their action, 3872
- KERR, W. J.
Ornithological notes from Denbighshire, 3913; Ferocity of the jackdaw, 3915; Crossbills in Denbighshire, Ravens nesting in North Wales, 4156; Shieldrakes breeding in Merionethshire, 4159
- LEGG, W. H.
Greater spotted woodpecker near Farnham, 4077; Name of a bird, 4201
- LLOYD, W. A.
On the occurrence of *Limulus Polyphemus* off the coast of Holland, and on the transmission of aquarium animals, 3845
- MATHEW, GERVASE F., R.N., F.L.S.
A visit to the breeding haunts of the frigate-bird, 3991; Ornithological notes from North Devon, 4131, 4249; Lesser spotted woodpecker at Instow, 4156; Green sandpiper, 4159; Ornithological notes from Dartmouth, 4230
- MATHEW, Rev. MURRAY A., M.A.
Bird notes from the west, 3824
- MITCHELL, J. G.
Economic value of alligators, 3954
- MOORE, GEORGE W. P.
Habitat of "rat-bats" (?), 4075; Curiously situated nests of tits, Tree sparrow building in Cambridgeshire, 4076
- MORE, A. G., F.L.S., M.R.I.A.
Salpa spinosa off the West Coast of Ireland, 4202
- NEWMAN, EDWARD, F.L.S.
The denizens of aquariums, 3876; Rhinoceros Sondaicus at the Zoological Gardens, 3949; *Astroides calicularis* of Milne-Edwards, 3955; Curious malformation in the mandibles of a shortfaced tumbler, 3998; Zoology of the Royal Academy, 4021; Collected observations on White's thrush, 4045; Communications and extracts concerning the marsh sandpiper, 4054; Gigantic squids, 4105; The guillemots at the Zoological Gardens, 4119; Memorandum on the crowned pigeon, 4197; Zoological Society's Gardens in Regent's Park, 4202, 4243; The explosion on the Regent's Canal, 4244; Moulting freak in a robin, 4258; The kakapo, owl-parrot, or night parrot, 4260; *Didunculus strigirostris*, 4261; The penguin at the Zoo, 4262; King crabs at the Crystal Palace Aquarium, 4266
- NEWTON, Prof. ALFRED, M.A., F.R.S.
The lesser redpoll not in Spitsbergen, 3880; Correction of an error, 4236
- NICHOLSON, FRANCIS
Honey buzzard in Cheshire, 4237; Orangelegged hobby in Cheshire, Chaffinch nesting in confinement, 4238
- NORGATE, FRANK
Rednecked phalarope at Salthouse, Norfolk, 4159; Lesser shrews and bank voles, 4236
- OGILBY, J. DOUGLAS
Hairy-armed bat in County Dublin, 4236
- OGILVY, WALTER T.
Buff variety of the house sparrow, 3914
- PALMER, J. E.
Honey buzzard near Huddersfield, 4153; Baillon's crane near Huddersfield, 4149
- PILLEY, J. B.
Landrail in January, 3953
- POTTS, T. H., F.L.S.
Notes on the birds of New Zealand, 3898, 3936, 3979, 4014; On recent changes in the Fauna of New Zealand, 4135; Recent occurrence of *Apteryx Haastii* of Potts, 4158

- PRATT, JOHN**
 Albino water rat, 4074
- RAKE, N. BEAVEN**
 Nesting of the tree sparrow, 4154
- RANDALL, W. SIDNEY**
 The common gull in captivity, 4129
- RICKARDS, MARCUS S. C., F.L.S.**
 Pomarine skua in North Devon, 4240; Richardson's skua near Clevedon and at Instow, 4241
- ROBERTS, GEORGE**
 Communications and extracts concerning the marsh sandpiper, 4054
- ROBINSON, Rev. E.**
 White woodcock in Ireland, 3915
- RODD, EDWARD HEARLE**
 White's thrush near Grampound, Cornwall, 3880; Garganey teal at the Land's End, 3953; Spring migrants, 3997; A vegetarian cat, 4031; Spring migration of the British warblers, 4032; Variation in the song of the blackcap warbler, 4075; Pratincole at the Lizard, Cornwall, 4077; Montagu's harrier, 4153; Buffon's skua near Falmouth, 4239; Woodcocks in the Scilly Isles, 4260; Greater shearwater on the Cornish coast, 4261
- ROPE, G. T.**
 Notes from Leiston, Suffolk, 3865; Early nesting of the sky lark, 4034; Nesting of the garganey and wild duck, 4036
- SAUNDERS, HOWARD**
 Spawning of flying-fish, 3838
- SAXBY, Rev. S. H., M.A.**
 Ornithological query, 4116
- SCLATER, JOHN**
 Notes from Castle Eden, 4066, 4221
- SMITH, CECIL**
 Ring ouzel, &c., at Exmouth, 3831; Ornithological notes from Somersetshire, 3868; The black gannet, 4239
- SMITH, JOSEPH, M.R.C.S., F.L.S., &c.**
 Notes on a mongoose, 4183
- STAFFORD, WILLIAM**
 Large snake at Godalming, 3837; Hobby at Godalming, Black redstart near Godalming, 3997; Wood pigeons laying in January, 3998; Cuckoo in confinement, 4035
- STEVENSON, H., F.L.S.**
 Ornithological notes from Norfolk, 3859, 4185; Dartford warbler in Suffolk, 3914
- SWEETAPPLE, EDWARD**
 English sparrows in Philadelphia, 4197; An old tortoise, 4242
- TATTON, T. E.**
 Curious nesting-place of the greater tit, 4076
- TAYLOR, W.**
 Caspian tern at Birmingham, 4036; Black gannet, 4199
- THOMAS, W.**
 Yellow wagtail and wild goose near Guildford, 4118
- TUCK, JULIAN G.**
 Birds in Cambridge Market, 4116
- WALKER, Rev. F. A., M.A., F.L.S.**
 Notes on the Lido, Torcello, and the Pineta, 3977
- WALLIS, HENRY MARRIAGE**
 Fossils from recent deposits in the Valley of the Thames, 3995; How the puffin ascends to its nest, 4118
- WHARTON, C. BYGRAVE**
 Nesting of the blue tit, 4034
- WHITAKER, J.**
 Siskins near Mansfield, 3880; Egyptian geese in Nottinghamshire, 3882; Ducks breeding on the Rainworth Water, 4159; Arrival of spring birds in Nottinghamshire, 4196; Chiffchaff, swift and fieldfare, 4197; Bartailed godwit in Nottinghamshire, 4199; White swallow, 4238

ALPHABETICAL LIST OF SUBJECTS.

- Ægialites hiaticula*, 3809
 Alligators, economic value of, 3954
 Angler or fishing-frog at the Manchester Aquarium, 4264
 Animals, aquarium, transmission of, 3845; and plants, observations on in reference to the theory of Evolution of Living Forms, 3925; structure, habits and economy of, 3965
 Apteryx, the; its mode of feeding, 4198
Apteryx australis, 3939
 Haastii, 4014; recent occurrence of, 4158
 Oweni, 3979
 Aquariums, the denizens of, 3876
Astroides calicularis of Milne-Edwards, 3955
 Auk, little, 3819; and dunlin, 4200
 Avocet, 4230

Barbastellus Daubentonii, 4128
 Bat, hairy-armed, in Ireland, 4071, 4236; noctule, food of, 4153; note on, 4194
 Bats, a flight of, 4075; British, notes on, 4125
 Bell, Thomas, F.R.S., 'A History of British Quadrupeds, including the Cetacea,' 4005
 Belt, Thomas, 'The Naturalist in Nicaragua,' 3925
Bernicla Brenta, 3814
 leucopsis, 3815
 Bird notes from the West, 3824
 Bird, frigate, visit to the breeding haunts of the, 3991
 snow, 3810
 Birds observed at Glenarm Castle, 3829; small, indifference of to the kestrel, 3834; of New Zealand, 3898, 3936, 3979, 4014; seen during a three weeks' tour in Brittany, 3945; pairing of, 3954; new classification of, 3987; summer, arrival of at Glenarm, 4032; nestling, complaint in, 4075; gymnogenous, 4095; hesthogenous, *id.*; in Cambridge Market, 4116; of Walney Island, 4191; shore, on the Cley and Blakeney Muds, 4196; arrival of spring, in Nottinghamshire, *id.*; in Guernsey, 4237; rare, at Eastbourne, 4258
 'Birds of Great Britain,' Introduction to the, 4085
 'Birds, their Cages and their Keep; being a Practical Manual of Bird-keeping and Bird-rearing,' 4245
 Bittern, little, 4063, 4118; near Epping, 4199
 Blackbird, 3865
 Blackcap, autumnal migration of, 4259
 Blackwall, John, F.L.S., 'Researches in Zoology, illustrative of the Structure, Habits and Economy of Animals,' 3965
Boreogadus Fabricii, 3820
 Bream, Ray's, near Penzance, 4266
 British Association for the Advancement of Science: Belfast (1874), 4195
 Buist, K. A., 'Birds, their Cages and their Keep,' 4245
 Bunting, blackheaded, 3866
 snow, 3805, 3857, 3862, 3864, 3913
 Buzzard, common, 3826, 3871, 3996, 4063, 4065
 honey, 3824, 3869; near Huddersfield, 4153; in Cheshire, 4237
 roughlegged, 3908
 Buzzard near Newmarket, 3830
 Buzzards in Norfolk, 4117

 Cassowaries, distribution of the species of, 4199
 Cat, a vegetarian, 4031
Cephus Mandti, 3817
Certhia familiaris, peculiar position in feet of, 3998
 Chaffinch nesting in confinement, 4238
 Chicken, four-legged, 3835
 Chickens, young, osprey carrying off, 3996
 Chiffchaff, 4197; autumnal song of, 4238
 Chimpanzee, death of, in the Zoological Gardens, 3952
Clausilia Rolfii in Surrey, 4243
Colymbus septentrionalis, 3817
 Cormorant, 4230, 4251
 Crabs, king, at the Crystal Palace Aquarium, 4266

- Crake, Baillon's, near Huddersfield, 4159; near Eastbourne, *id.*
 ——— corn, 3881
 Crane, 3861
 Creadion *carunculatus*, 3936
 Crossbill, 3913
 Crossbills in Denbighshire, 4156
 Crow, hooded, 3862, 4030
 Cruises, Dredging, of H.M.S.S. 'Porcupine' and 'Lightning' in 1868, 1869 and 1870, 3885
 Crustacea and fish in the tanks, &c., at Concarneau, 3947
 Cuckoo, 4066, 4132; in confinement, 3833, 4035; singing at night, 4238
 Curlew, 4031, 4134, 4250
 ——— pigmy, 3869
 'Depths of the Sea,' 3885
Didunculus strigirostris, 4261
 Diver, great northern, 3908
 ——— redthroated, 3817, 3945
 Dormice breeding in confinement, 3829
 Dorse near the Lizard, Cornwall, 4080
 Dotterel, ringed, 3867
 Dotterels, 4060, 4064
 Dove, stock, 4063
 ——— turtle, 3867
 Dovekie, Mandt's, 3817
 Duck, burrow, 4133
 ——— eider, 3816
 ——— king, 3817
 ——— longtailed, 3816
 ——— tame, voracity of a, 4078
 ——— wild, nesting of, 4036; flock of, 4064; nest of, 4190
 Ducks, black, 3906
 ——— hybrid; breeding, 3836; breeding on the Rainworth Water, 4159
 Dunlin, 4030, 4062, 4064, 4132, 4133; and little auk, 4200; wounded, herring gull carrying off a, 3828; enormous flocks of, 3912
 Eagle, singular capture of, 3953
 ——— golden, at Powerscourt, 3952
Emberiza nivalis in full summer plumage, 3914
 Entomological Society of London, proceedings of, 3840, 3883, 3922, 3960, 4003, 4042, 4080, 4160
 'Entomologist's Annual,' conclusion of, 3955
Eudromias morinellus, 4060
 Explosion on the Regent's Canal, 4244
 Falcon, peregrine, 3856, 3870, 3871, 4190, 4252
 Fauna of Spitsbergen, notes on the, 3805; of New Zealand, on recent changes in the, 4135
 Fieldfare, 3860, 4197
 Fieldfares feeding upon apples, 3830
 Fish, a new, 3837; distinguished by their action, 3872; and Crustacea in the tanks, &c., at Concarneau, 3947; supposed new, at Penzance, 4255
 Fishes, the sleep of, 3878, 3895; killed at Scilly by the late gale, 4000
 Fishing frog at St. Leonard's, 4000; at the Manchester Aquarium, 4264
 Flycatcher, pied, in Norfolk, 4117, 4191; curious nesting of, 4197
 Flying-fish, spawning of, 3838
 Food of water shrew, 3829; of the salmon, 3839; of mute swan, 3915; of barn owl and great spotted woodpecker, 4117; of the noctule bat, 4153
 Forkbeard, greater, off Looe, Cornwall, 3839
 Fossils from recent deposits in the Valley of the Thames, 3995
Fratercula arctica, 3819
 Gannet, 3906, 3945, 4066
 ——— black, 4199, 4239
 Garfish, salmon-peal attacked by a, 4160
 Garganey, 3868, 4191; nesting of, 4036
 Geese, Egyptian, in Nottinghamshire, 3882
 Godwit, bartailed, 3912, 4060; in Nottinghamshire, 4199
 Goldcrest, 3823
 Goose, bernicle, 3815
 ——— brent, 3814
 ——— pinkfooted, 3943
 ——— wild, and yellow wagtail, near Guildford, 4118
 Gould, John, Introduction to the 'Birds of Great Britain,' 4085
 Grebe, great crested, at Luton, 3836
 ——— little, 4065
 Grebes, 4189
 Greenfinch, 4029
 Guillemot, Brunnich's, 3817
 Guillemots, 3906, 3945, 4226; and razorbills, note on the changes of plumage in, 3954; at the Zoological Gardens, 4119

- Gull, blackheaded, 4252
 — brownheaded, 4224
 — common, in captivity, 4129
 — glaucous, 3811, 3822, 4120
 — herring, 4134; carrying off a wounded dunlin, 3828
 — Iceland, 3912, 4078
 — kittiwake, 3810
 — little, near Shrewsbury, 4262
 — redlegged, 3870
 — sea, affection of for its young, 4201
 Gulls, 3947, 4065, 4135
 — blackbacked, 3863
 — blackheaded, 4065, 4189
 — glaucous, in East Yorkshire, 3836
 — sea, inland, 3862
 Halcyon vagans, 3898
 Harelda glacialis, 3816
 Harrier, marsh, 3860, 4117
 — Montagu's, 4153
 Hawfinch, 3864
 Hen, domestic, prolonged existence of without food, 4035
 Heron, 3858, 4230
 Heronry in Sussex, 3953
 Herons in Richmond Park, 3835; nesting, 4188
 Hobby near Plymouth, 3829; near Newmarket, 3830; at Godalming, 3997; at Northrepps, 4190
 — orangelegged, in Cheshire, 4238
 Hoopoe at Knotts Green, Leyton, 4035
 Hybrid ducks breeding, 3836
 Ibis, glossy, 4158
 Immigrants, spring, migrations of, 4100
 Insects observed on the Lido, 3977
 Jackdaw, ferocity of the, 3828, 3915
 Jackdaws, 3945
 Jay, 3945
 Kakapo, owl-parrot, or night parrot, 4260
 Keropia crassirostris, 3902
 Kestrel, indifference of small birds to the, 3834
 Kingfisher, 3861, 3898, 4230, 4252
 Kite at Nantygroes, near Presteign, 3953
 — royal, longevity of, 3830
 Kiwi, 3979
 Kiwi, big, 3939
 — Haast's, 4014
 Knot, 3826, 3856, 4060, 4251
 Lagopus hemileucurus, 3808
 Landrail in January, 3953
 Lapwing, 3862
 Lark, crested, 3945
 — short-toed, and other birds, at Brighton, 3832
 — sky, early nesting of, 4034
 Larus glaucus, 3811
 Limulus Polyphemus off the coast of Holland, 3845
 Linnean Society of London, proceedings of, 3918, 3956, 4001, 4038, 4120
 Linnet, variety of, 3912
 Linota linaria, 3806
 Lobster, pied, 4080
 Lump sucker, small, 3839; and whiff off the Cornish coast, 4037
 Mackerel, 3878; the species of, 4037
 Magpie, 3945
 Mallard, common, 4252
 Martin and house sparrow, mortality of, 4155
 Martin, house, 4063; near Aylesbury on the 5th of December, 3833
 — sand, 4065; starling laying in the hole of, 4077
 Martins, house, late stay of, 3833; scarcity and late stay of at Selborne, *id.*; is their late stay dependent on the wind? 3834; late, 3864, 3881; early congregation of, 4157
 Merganser, 4134
 Mergulus alle, 3819
 Migrants, summer, 3861, 3862; spring, 3997, 4188, 4190; summer, arrival of in May, 4060
 Migrations, autumnal, 3824; of the willow wren, swallow, and black-cap, 4259
 Mole, curious instinct in the, 3879
 Mongoose, notes on a, 4183
 Mouse, harvest, 3865
 Museums, a word about, 4056
 Name of a bird, 4201
 Nest of lesser redpoll, 4189; of wild duck, 4190
 Nesting of the blue tit, 4034; early, of the sky lark, *id.*; of the garganey and wild duck, 4036; of the tree sparrow, 4076, 4154; of ravens in

- North Wales, 4156; of herons, 4188; curious, of the flycatcher, 4197; of the golden oriole, 4232; of the chaffinch in confinement, 4238
- Nesting-place, curious, of the greater tit, 4076
- Nests of tits, curiously situated, 4076
- 'Nicaragua, Naturalist in,' 3925
- Nightingale, 4190
- Notes on the Fauna of Spitsbergen, 3105; bird, from the West, 3824; from Leiston, Suffolk, 3865; on the birds of New Zealand, 3898, 3936, 3979, 4014; on the Lido, Torcello, and the Pineta, 3977; ornithological, 4063; from Castle Eden, 4066, 4221; on British bats, 4125; on the birds of Walney Island, 4191
- Nuthatch, 3864
- Nyctea nivea, 3806
- Octopus at Plymouth, 4037
- 'Official Handbook to the Collection of Animals of the Wurtemberg Stuffed Animals Company,' 3974
- Oriole, golden, nesting of in Kent, 4232
- Ornithological jottings, 4231
- Ornithological notes from West Sussex, 3822; from Devonshire, Cornwall, &c., 3826, 3909, 3943, 4102, 4226, 4253; from North Lincolnshire, 3856, 3942, 4029, 4059, 4224; from Norfolk, 3859, 4185; from Somersetshire, 3868; from Torquay, 3906, 4065; from Lancashire, 3912; from Denbighshire, 3913; from North Devon, 4131, 4249; from Dartmouth, 4230
- Ornithological query, 4116
- Ornithology of the Orkneys, 3883
- Osprey, 3860; carrying off young chickens, 3996, 4117
- Ostrich economy, 3917
- Ostriches pairing, 3916; hatching their eggs, 4198
- Otter, large, in the Isle of Wight, 3952
- Ouzel, ring, &c., at Exmouth, 3831; on Dartmoor, 4230
- Owl, barn, and great spotted woodpecker, food of, 4117
- brown, 3871
- eagle, at Bridgnorth, 3997
- snowy, 3808; nidification of in confinement, 4154
- Owl-parrot, 4260
- Oystercatcher, 3822, 4134, 4224, 4250
- Pagophila eburnea, 3810
- Parrot, night, 4260
- Partridge, redlegged, 4224
- with white "horseshoe," 3834; perching in a tree, *id.*; and sparrowhawk, 3869
- Partridges, late breeding of, 4260
- Peewit, 4029
- Pelican, an escaped, killed at Faversham, 4262
- Penguin at the Zoo, 4262
- Peregrine near Newmarket, 3830
- Peregrines in the Isle of Wight, 4032; at Torquay, 4066
- Petrel, fulmar, 3814
- Phalacrocorax punctatus, 4015
- Phalarope, gray, 3859; in Cornwall, 4239; in Cheshire, *id.*
- rednecked, at Salthouse, Norfolk, 4159
- Pigeon, crowned, memorandum on the, 4197
- Pigeons, wood, laying in January, 3998; carrier, press, 4157
- Pilot-fish at Plymouth, 4266
- Pimelepterus Cornubiensis, a supposed new fish, at Penzance, 4255
- Pintail, 3943
- Pipit, tawny, at Brighton, 3832
- Plecotus auritus, 4128
- Plectrophanes nivalis, 3805
- Plover, golden, 3826, 3858, 4029
- gray, 3912, 4060
- Norfolk, 3862, 3867
- ringed, 3809, 4061, 4064
- Pratincole at the Lizard, Cornwall, 4077
- Procellaria glacialis, 3814
- Ptarmigan, 3808
- Puffin, 3819; how it ascends to its nest, 4118
- 'Quadrupeds, a History of British, including the Cetacea,' 4005
- Quail, Virginian, in Northamptonshire, 3835
- Rabbit with one ear, 4153
- Rail, spotted, 4253
- water, 3881, 4036, 4064
- Rat, common, piebald and malformed, 3996
- water, albino, 4074
- "Rat-bats," habitat of, 4075

- Rats, two, curious malformation of the incisor teeth in the skulls of, 3935
 Ravens, 4066; nesting in North Wales, 4156
 Razorbills and guillemots, changes of plumage in, 3954
 Redbreast, accident to a, 4194
 Redpoll, 3806
 ——— lesser, not in Spitsbergen, 3880; and siskin, 4034; breeding near Norwich, 4117; nest of, 4189
 ——— mealy, 3863
 Redshank, 3867, 4063, 4064, 4252; malformation in upper mandible of, 3999
 Redstart, black, in summer plumage in November, 3832, 3913; near Godalming, 3997
 Report of Committee appointed "To obtain Information respecting the subject of a Marine Aquarium, with the view of promoting a sufficient Institution of the kind in Birmingham," 4110
 'Researches in Zoology,' 3965
 Rhinoceros Sondaicus at the Zoological Gardens, 3949
 Rhinolophus Ferrum-equinum, 4129
 ——— Hipposideros, *id.*
 Rissa tridactyla, 3810
 Robin, 4131; moulting freak in a, 4258
 Robins feeding young thrushes, 4033
 Roedeer, female, with horns, 3829
 Roller, 4158
 Rooks, 4133
 Ruff, 3913

 Saddleback, 3936
 Salmo alpinus, 3820
 Salmon, food of, 3839; in the River Coquet in the last century, 4160
 Salmon-peal attacked by a garfish, 4160
 Salpa spinosa off the West Coast of Ireland, 4202
 Sanderling, 4188
 Sandpiper, common, 4132, 4252
 ——— curlew, 4226, 4251
 ——— green, 3859, 4159
 ——— marsh, communications and extracts concerning, 4044
 ——— purple, 3809, 4064
 ——— wood, 3859
 Saxby, Henry L., M.D. (the late), 'The Birds of Shetland, with Observations on their Habits, Migration, and Occasional Appearance,' 4165, 4205
 Scotophilus Leisleri, 4071
 Shag, spotted, 4015
 Shark, Beaumaris, taken off Hastings, 4201
 ——— fox, off Scilly, 4080
 Shearwater, greater, in Bridlington Bay, 3882; on the Cornish coast, 4261; on the coasts of Devon and Cornwall, 4262
 ——— Manx, 3907
 'Shetland, Birds of,' 4165, 4205
 Shieldrake, 4065
 Shieldrakes breeding in Merionethshire, 4159
 Shoveller, 4191
 Shrew, water, food of, 3829
 Shrews, lesser, and bank voles, 4236
 Siskin and lesser redpoll, 4034
 Siskins near Mansfield, 3880; breeding in Ireland, 3914
 Skua, arctic, in Lincolnshire, 3837
 ——— Buffon's, 3823, 3825, 3869; near Falmouth, 4239
 ——— common, 3813
 ——— great, 4225
 ——— longtailed, 3813
 ——— pomarine, 3812; in North Devon, 4240
 ——— Richardson's, 3823; near Clevedon and at Instow, 4241
 Skuas, 3907
 Snake, large, at Godalming, 3837
 Snipe, 3947; abundance of, 3825; eggs of and young, 3867
 ——— Sabine's, in Co. Galway, 3836
 ——— solitary, in Lancashire, *id.*
 Somateria mollissima, 3816
 ——— spectabilis, 3817
 Sparrow, house, buff variety of, 3914; and martin, mortality of, 4155
 ——— tree, 3856, 3997; building in Cambridgeshire, 4076; nesting of, *id.*, 4154
 Sparrowhawk, 4030; and partridge, 3869
 Sparrows, English, in Philadelphia, 4197
 Spoonbill in Guernsey, 3835
 Squids, gigantic, 4105
 Starling, 3866, 4230
 Starlings laying in the hole of a sand martin, 4077; and greater spotted woodpecker, *id.*
 Stercorarius longicauda, 3813
 ——— parasiticus, *id.*
 ——— pomatorhinus, 3812
 Sterna macrura, 3809

- Stint, Temminck's, 3823
 Stork, white, near Berwick-on-Tweed, 4199
 Swallow, 4065; song of, 4156; white, in Nottinghamshire, 4238; autumnal migration of, 4259
 Swallows, scarcity and late stay of at Selborne, 3833; is their late stay dependent on the wind? 3834; varieties of, 3862; late, 3881; roosting on rushes, 4035
 Swan, mute, and its food, 3915; in Guernsey, 4239
 Swift, 4131, 4197
 Swifts, late stay of, 3825
 Teal, 4029, 4252
 — garganey, at the Land's End, 3953
 Tern, arctic, 3809, 4134
 — Caspian, at Birmingham, 4036
 Terns, 4225
 Thompson, C. Wyville, LL.D., &c., 'The Depths of the Sea,' 3885
 Thrush, 3102
 — mistletoe, 4224
 — White's, near Grampound, Cornwall, 3880; collected observations on, 4045
 Thrushes, young robins feeding, 4033
 Tit, bearded, 3866
 — blue, nesting of, 4034
 — cole, 3866
 — crested, 4065
 — greater, curious nesting-place of, 4076
 Tits, blue, 4187
 — curiously situated nests of, 4076
 Tortoise, an old, 4242
 'Transactions of the Norfolk and Norwich Naturalists' Society,' 4097
 Tringa maritima, 3809
 Tumbler, shortfaced, curious malformation in the mandibles of a, 3998
 Turnstone, 3942, 4062, 4251
 Turtle, 3878; in Mount's Bay, 4242
 Uria Brunnichi, 3817
 Variety of linnet, 3912; of house sparrow, 3914; of the common rat, 3996; of the water rat, 4074; of the lobster, 4080
 Varieties of the swallow, 3862, 4238
 Vespertilio Daubentonii, 4127
 — emarginatus, *id.*
 — mystacinus, 4128
 — Nattereri, 4127
 — Noctula, 4125
 — pipistrellus, *id.*
 — pygmaeus, *id.*
 — serotinus, 4126
 Viper, bite of, 4079
 Voles, bank, and lesser shrews, 4236
 Waders on Breydon, 3859, 4190
 Wagtail, pied, 4029
 — Ray's, 3866
 — white, 3947
 — yellow, and wild goose, near Guildford, 4118
 Warbler, blackcap, variation in the song of, 4075
 — bluethroated, at Chatteris, Cambridgeshire, 3953
 — Dartford, in Suffolk, 3914
 — garden (?), 3864
 Warblers, 4066; British, spring migration of, 4032
 Weasel, accident to a, 4194
 Wheatear, 3868, 4063, 4132
 Whiff and lumpsucker off the Cornish coast, 4037
 Whimbrel, 4060, 4132, 4133
 Wigeon remaining in summer, 3860; in Somersetsshire, 3870; in North Lincolnshire, 3943
 Wild-fowl, abundance of, 3825; on the Lincolnshire coast, 3942
 Woodcock, early, 3825
 — white, in Ireland, 3915
 Woodcocks, 3947; in the Scilly Isles, 4260
 Woodpecker, greater spotted, near Farnham, 4077; and starlings, *id.*; and barn owl, food of, 4117
 — green, 4063
 — lesser spotted, at Instow, 4156
 Wren, willow, autumnal migration of, 4259
 Zoological Society of London, proceedings of, 3919, 3958, 4040, 4122, 4267
 Zoological Society's Gardens, in Regent's Park, 4202, 4243, 4267
 Zoology of the Royal Academy, 4021

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Notes on the Fauna of Spitsbergen.

By the Rev. A. E. EATON, M.A., Memb. Ent. Soc. Lond.

(Continued from Zool. S. S. 3772.)

BIRDS.

Re-addition to the Fauna:—Lesser redpoll (*Linota linaria*). Desiderata obtained:—Pomarine skua (*Stercorarius pomatorhinus*), longtailed skua (*S. longicauda*), and brent goose (*Bernicla leucopsis*).

Plectrophanes nivalis (Snow Bunting).—In the former part of this paper I have mentioned our meeting with flights of snow buntings, towards the end of May, flying westward, when we were at the Western Ice. There was a small flock of them on the east side of King's Bay on the 8th of June, when the land was mostly covered with snow, flitting from patch to patch of bare ground in search of food. Three days later we found them in pairs at Norway Islands, and in full song. On the 29th of June I found a nest at Walden Island containing three blind young. My guard and I (for there being a suspicion of bears about the place, the captain had insisted upon my being attended like a convict by a man with a loaded rifle) saw the old birds flying about a crevice in a cliff behind a large slab of rock. He at first pronounced it inaccessible, for there was no ledge for one's feet nearer than the base of the cliff, some yards below. By grasping the top of the slab I was able, however, to swing myself hand over hand out to where the old birds had entered, though not having anything to stand upon when I got there I could not examine the nest or do more than look hastily at it. A very old nest was in the same

crevice near the new one. We again met with flocks of buntings towards the end of August at North Cape and Phipps's Island. A single bird flew past us southwards on the 16th of September, when we were some twenty-nine miles S.W. by W. magnetic of Hope Island. This was not the last we saw of them, for during a lucid interval in sea-sickness I noticed one flying round the ship in lat. 61° , about forty miles N.E. by N. of Shetland.

Linota linaria, L. (Redpoll).—"On our approach to Spitsbergen, several of this species alighted on different parts of the ship, and were so wearied apparently by being on the wing, though our distance from the land was not above ten miles, that they allowed themselves to be taken alive. How this little creature subsists, and why a bird of such apparent delicacy should resort to such a barren and gelid country, are questions of some curiosity and difficulty. It must be migratory," &c. (Scoresby, *Aret. Reg.* i. 537). Nobody but Scoresby having claimed to have found a redpoll in Spitsbergen, the statements cited above have been supposed by general consent to apply to the snow bunting. And yet when we found a redpoll in lat. $75^{\circ} 13' N.$ at the Western Ice, as has been previously stated, we began to suspect that Scoresby after all might be correct in his observations. In the evening of the Sixth Sunday after Trinity, I went ashore in Wiide Bay with James Kidd. He took my gun, as I wanted some ptarmigan, and we thought we might fall in with deer. On landing we first worked eastward, not far from the shore, where patches of moss and willow encouraged us to look for plants and insects; but we found little besides a few common things and some spiders. So we gradually took ground to the left, ascending the slope of the hills, and passing by a lakelet, made our way into the next valley. There we saw two pairs of long-tailed skuas, the first we had met with in the country. Kidd went after them, but they flew away out of sight up the opposite mountain. We then proceeded along the foot of the western side of the valley until it met a range of lofty cliffs too steep to be ascended, which extended to and beside the inevitable glacier a little further on, and helped to confine it. A slope of broken rocks was above us, up which we scrambled until we reached the higher ground again, frequently pausing in our ascent,—of course to admire the view. Ptarmigan were the objects of our quest, and we presently came upon a hen with her brood. We wanted the old cock; and as soon as Kidd had caught

one of the chicks as a lure, down he flew from the hill above and alighted close to us in a state of great excitement. Kidd was getting ready to shoot him, when a redpoll passed by and settled on a rock near at hand. Before I could get within range of it, off it flew and vanished out of sight; so I returned to our ptarmigan and shot the cock. The widow and family were not wanted; they walked slowly away. We had just found another cock, and were walking up to it when two deer came into view below us. I signalled their approach to Kidd, and he made his way to where I was standing. They were on the move, and out of range, to the windward of us. For some minutes we crouched behind a rock watching them as they advanced, feeding here and there amongst the rocks until they passed over the brow of the slope into the valley we had lately left. Kidd went after them, but failing to see them again, he relieved his feelings by shooting at two spinstar ptarmigan which were sitting side by side upon a rock above him. When he brought them up to me I showed him a cock, which he failed to secure. In going after it, however, he found *Cystopteris fragilis* growing amongst loose stones at the foot of the cliff. Re-directing him to where the ptarmigan was patiently waiting to be shot at again, I hastened to examine the fern *in situ*. On my way I heard a redpoll singing, and shouted to him the intelligence. The ptarmigan would wait any length of time, so he made at once for the songster. Presently it flew down from the cliff and alighted in the valley beneath, where he very soon shot it and placed it in my hands. Resuming the ptarmigan hunt he walked towards the cliffs, where it was waiting for him still, whilst I returned to my slope to search for plants. In the course of a few minutes he came back, not with the ptarmigan (he could not find it), but with *Campanula uniflora*, and I meanwhile had found a *Gentiana*, and had seen an *Eudorea* new to the country. In going after my net to catch the moth, I flushed the long-sought-for ptarmigan. Pursued by the relentless engineer for a quarter of a mile down the valley, it received another charge of No. 8, with little damage, and then started to fly back again to me. It alighted at the foot of the slope; and stood there, stretching out its neck from behind a stone, and blinking its eyes at me. I thought it must be feeble through having been struck with two charges of shot; so after pelting its head with a tolerable number of rocks, which I could see and hear strike it, and the bird had tumbled over once or twice, I tried to

catch him with my ring-net. But though he was prepared to submit to be stoned, and would probably have held out his neck for an indefinite length of time, to be netted alive with a common fly-net was an indignity with which he really could not put up. When last seen he was flying with undiminished vigour over the shoulder of a mountain no one knows how far away. As Kidd remarked, "It was a very curious-like animal." We returned to the 'Diana' after that. Apparently redpolls are not uncommon in that part of Wiide Bay. Our men saw five or six on the uplands in the same neighbourhood. They also found a nest upon the ground, containing five eggs, blue spotted with reddish, which were possibly redpoll's, but may have been snow bunting's. As these were hard set they did not bring them to me. The crop of the example shot by Kidd was full of small seeds.

Nyctea nivea (Snowy Owl).—Captain Walker, of the 'Samson,' fired at a snowy owl, with a rifle on the 18th of August, in a valley running out of Green Harbour. It was one of the finest he had ever seen. As he was after deer at the time, and was very familiar with this species of birds in the Straits, he did not think it worth his while to make any further effort to secure it.

Lagopus hemileucurus, Gould (Ptarmigan).—Leaving to Prof. Newton all critical remarks upon the speciality of the Spitsbergen ptarmigan, I will give here a *resumé* of our more general observations. The birds were not scarce in King's Bay. Messrs. Potter and Chermiside killed several brace there at the end of May. The cocks were yet in their winter plumage, but all the hens were brown. When do these become white? In July we found in Wiide Bay plenty of ptarmigan, the cocks presenting different stages of advancement towards the completion of the moult. But it was not until August that I met with a cock in his full summer dress. It was low down in the cliffs in Lomme Bay, close to the sea, and I knocked him over with a stone. He was just as stupid as the bird chased by Kidd in Wiide Bay, standing in the same way within three or four yards of me, stretching out his neck and blinking his eyes, moving only now and then a few steps at a time, until a stone struck him. Then being not much hurt (they are such tough birds) he began to walk slowly away, and allowed me to throw at him again, this time with more success. Their call resembles that of a reindeer; they utter also a glucking noise when they are surprised or are with their brood. They are usually found

high up on the hills, seldom by the shore, in the summer. They occurred, however, on some islands in East Fiord, Wiide Bay; and the Swedes killed seventy-five brace in the spring on a low island in Mossel Bay. Their favourite diet is buds and twigs of the polar willow; but the crop of one bird contained grass, *Draba* seed, *Stellaria* tops, and *Polygonum* blossom, besides willow leaves.

Ægialites hiaticula (Ringed Plover).—Lieut. Chermiside saw a ringed plover in Wiide Bay, which attempted to entice him away by shamming lameness, as if its nest was close at hand.

Tringa maritima (Purple Sandpiper).—This species is common in most of the places visited by us. It occurred at Table, Phipps's and Walden Islands, as well as in North East Land. We obtained a set of eggs, three in number, on the 3rd of July, in Treurenberg Bay, and another set on the 16th in Albert Dirkes's Bay, where I found also three newly-hatched young. These last were unfortunately killed by their mother when I flushed her. They lay in a slight depression formed accidentally between some stones which did not quite meet each other, utterly devoid of anything resembling the rudiments of a nest. In the breeding season the old birds have a peculiar habit of occasionally raising one of their wings vertically over their back as they run along uttering their cry. They do so more especially on alighting after a short flight. At all times they are remarkably tame, and will continue to feed within a few yards of you. During the summer they disperse themselves over the country, and may sometimes be met with on the top of high hills, though their usual haunts are the borders of streams and wet ground on the slopes between the sea and the mountains. In such places they find plenty of insects amongst the stones, and of small white worms in the softer soil. When the frost sets in and the first snow covers the ground, they leave these situations and endeavour to better themselves by the sea-side. Here they may be seen sauntering about in small parties, eagerly searching for food amongst the refuse rejected by the sea, until at last they can put up with that style of living no longer, and resolve to emigrate. Foxes meanwhile are going amongst them, like popular agitators, acting the *role* of disinterested benefactors, bent upon covertly maintaining themselves and their families at the expense of the objects of their most sedulous attentions.

Sterna macrura (Arctic Tern).—The arctic tern was of frequent occurrence with us. In the lagoons by the shore considerable

numbers of them flock together fishing for sessile-eyed Crustacea. We took their eggs in Wiide, Treurenberg and Lomme Bays and Moffen Island, at which last place screaming young ones were running wildly about the beach with no one to look after them. They were not in schools, as little seals of their age would have been. When they have eggs, the old birds fly at all intruders, making a noise like castanets while they dart at your head. They are not in dread even of skuas, should they threaten too near an approach to the place of incubation—one cannot, even in courtesy, call it a nest. During the intervals of fishing they may often be seen resting in small groups upon the ice in reclining attitudes.

Pagophila eburnea (Snow Bird).—We could not get any snow-bird's eggs, though places where they breed were visited by us. In Wiide Bay and Cape Oetker some of the nests seemed accessible, but we had not sufficient time to endeavour to reach them. The crew were never tired of shooting at them whenever they had a chance of being able to kill more than one bird at a shot; and opportunities for doing this seemed to occur throughout the day and night whenever we killed a seal or morse and left its krang on the ice near the ship. Sometimes they were shot on the water as they were swimming and fishing for Crustacea or *Clione borealis*. In all fifty or sixty of them must have been killed. In the days when our ancestors subsisted upon salt sheep during the winter, and required the assistance of a servant every night to conduct them in safety to bed, snow-birds must have lived in a most *recherché* style." "Food, according to Captain Sabine, blubber and the flesh of whales,"—such was their diet in the good old times. Now-a-days they are so reduced in circumstances as to be thankful for shrimps, and to be not above soliciting small gratuities from their neighbours. Their attitude while resting on the ice forms a pretty contrast with that of the recumbent terns. Snow-birds, when they alight, either walk or stand still; they do not lie down. As to *where* they walk, that is a matter about which they are not over particular. We saw some at Lomme Bay, seemingly quite at home, very far within the interior of White Whale's krangs, from whence they would now and then emerge with their heads covered with blood.

Rissa tridactyla (Kittiwake Gull).—The cliffs of Carl's Island, in Hinlopen Straits, are frequented by kittiwakes and glaucous gulls, who live there in separate communities not far apart.

Dovekies indiscriminately occupy the neighbouring crevices. The largest number of young kittiwakes in a nest appeared to be three; they are about the prettiest sea-bird in the country. High hummocks and picturesque pieces of drift ice are much resorted to by parties of them during the summer. Like their namesakes, these fair kitties make a great pretence of being busily occupied in what is mere fancy work, and are much sought after by the lords of creation if they happen to possess a little something of their own. They always appear to be fishing for pteropods and shrimps, and are chased by some bird more powerful than themselves whenever they succeed in catching any. They also catch *Boreogadi* amidst the ice.

Larus glaucus (Glaucous Gull).—Burgomasters all the world over are remarkable for their fussy obtrusiveness. We were therefore not surprised to find them in Spitsbergen everywhere making a great noise about nothing at all, and meddling officiously with matters that did not concern them. They need no placard or notice-board to tell them that positions commanding extensive sea-views are "eligible sites for building purposes," for without their being recommended to them they are sure to thrust themselves into the most prominent and conspicuous places, even though these be no higher than the level of the platform of a stump orator. Burgomasters usually treat one another with great deference, and are much more looked up to by the common looms, who report the movements of these noble birds to the general community as matters of the greatest importance. Every eye is directed towards them whenever they deign to take an airing along the crowded cliffs. At Alk Range we found many nests with young on the 13th of July. Most of them were placed on pinnacles or buttresses of rock projecting from slopes easy of access at moderate heights above the sea: some were inaccessible, being on the summits of castellated cliffs and towering precipices; a few were in the very midst of the looms. I found other nests high up in the cliffs of a valley receding from Wiide Bay, near the entrance of East Fiord, in company with rotches and dovekies. But they do not always select lofty situations. About four miles east of Alk Range, on an island of hyperite in Hinlopen Straits, a burgomaster's nest was on a wide ledge of rock not twenty feet above the sea, surrounded (at a respectful distance) by sitting eiders. Another at Mofsen Island was built upon the upturned roots of a spruce fir, amongst the drift wood,

about two feet from the ground. On the 15th of June our men took some eggs, which they found on the shore in Dane's Gat. Burgomasters stand in some awe of snow-birds on ice, and are rather afraid of "mollies" in the water. Time was (we read in a certain arctic author) when mollies were apt to fall into violent hysterics, and even to die outright through fear, if a burgomaster so much as opened his mouth in paying his attentions to them, the harshness of his voice being rather too much for their delicate nerves. I am happy to be able to affirm that since the days when this sort of things used to go on, a great change has been effected for the better in the relations subsisting between these two classes of the Spitsbergen community. The mollies of the period no longer surrender themselves unconditionally to the first burgomaster who may be pleased to make up to them, no matter how loudly he may give utterance to the feelings which he cannot suppress. Nor are the burgomasters quite so much addicted to bluster as their ancestors. All this is clearly attributable to the agency of Natural Selection. The hysterical mollies evidently could not have had any descendants to whom their qualities could be transmitted; because they all died of fright. The race was therefore perpetuated only through the line of the stronger-minded ones. The burgomasters of the day, finding that these were not very much afraid of them, had the sense to lay aside most of their swagger and adopt in its stead a more gentle and quiet demeanour. Where we still meet with individual instances of overbearing pomposity and bullyism, or of sentimental affectation, may we not fairly account for their existence on the principle of Ancestral Reversion?

Stercorarius pomatorhinus, Temm. (Pomarine Skua).—The first skua in the list was the last species obtained by us. The chief engineer, Mr. William Forbes, shot it for me near Cape Oetker, in Hinlopen Straits, on the 13th of August. Five others were afterwards killed by our men in the same neighbourhood, some of them in immature plumage; and we could have obtained almost as many as we pleased when we were lying off Low Land. They are scarce on the western coast of Spitsbergen; only one was seen by us in Magdalena Bay, and that was on the 6th of September or thereabouts. On the 13th and the 15th of September I saw a few on and near Hope Island. When the boatswains were chasing kittiwakes and snow-birds one day in Hinlopen Straits, in their usual way, I saw one seize a snow-bird by the tail and hold fast to it. Down

went the birds together, almost falling into the sea; but the boatswain succeeded in eliciting nothing but shrieks out of the snow-bird's mouth by this violent treatment, and flew away sadly disappointed.

Stercorarius parasiticus, L. (Common Skua).—The "short-tailed boatswain," as the men designated this species, occurred in every part of Spitsbergen visited by us, including Hope Island and the Seven Islands. It breeds on gentle slopes or low flat ground, usually close to a streamlet, and we found eggs and young in several places. In Lomme Bay I found two sets of eggs, each consisting of a couple. They were laid in slight hollows upon the bare ground, one of which contained three dead and wiry stalks of *Papaver alpinum* by way of a lining—equivalent perhaps to as many knitting needles; the other had no such ornaments. We found a down-clad brood at Hecla Cove in July. A month later there were young ones flying about in various localities. The parent birds defend their breeding place against all comers, and when menaces take no effect resort to stratagem, flapping about upon the ground like plovers, and making a plaintive cry. Foxes, dogs and deer are objects of their most inveterate animosity. Availing ourselves of this trait, we took a dog from the ship with us whenever we wanted to shoot a skua, either of this or of the other two species, and it seldom failed to entice them within range of the gun. This skua pursues rotches and doveckies on their passage to and from the cliffs; it sometimes also chases looms, and more rarely still snow-birds and kittiwakes. On ice they repose upon their breast like mollies. During the whole of our voyage we saw only three of them settle on the water to swim—one at Walden Island, another in Wiide Bay, and the third in the Greenland Sea. Towards the end of the breeding season, when the young were able to fly, I saw several females which had the gray band across the breast incomplete, who were mated to males which possessed the band uninterrupted; and this in places where, at the time of our previous visits, both the sexes had possessed unbroken bands.

Stercorarius longicauda, Vieillot (Longtailed Skua).—Two days after he had shot the redpoll in Wiide Bay, James Kidd fired at a longtailed skua, which flew away wounded. The next day he killed one, and the first engineer another, shooting from the ship whilst we were lying off Diana Island, near the entrance to East Fiord. Other specimens were shot the same day. We afterwards

observed the species in East Fiord again; one in Lomme Bay; a few more between Cape Torell and Low Land; and another off Hakluyt's Headland. They did not appear to have bred in any of these places, nor did we see any young of the year, though the adults were in pairs.

Procellaria glacialis (Fulmar Petrel).—The molly is such a well-known bird that there is no occasion to say much about it. They appeared to be breeding at Cape Fanshawe and in Wiide Bay; but we got no eggs.

Bernicla Brenta, Steph. (Brent Goose).—This bird goes by the name of "rein-geese" in Spitsbergen, not without good reason apparently, as I will presently show. The Swedes told us at Mossel Bay that rein-geese breed on the uplands early in the season, where they fly about in couples; and observed that the nests are not easily found. As soon as they see that their better halves have become hopelessly involved in the cares of the nest, the ganders pretend that they are called away on business, and go to the lakes, where they have a fine time of it. But the eggs are hatched before very long, and then they have the goslings to look after. They cannot get out of their responsibility, for their whole family comes down to the water, and, moulting supervening, they are for some time incapable of flight. When they are tired of one lake they walk over land to another without incurring much risk on the passage; for though they are unable to fly, cannot they run! Lieut. Chermiside found an egg, which he ate, at Bear Hole, in Verlegen Hook (misspelt "Vertegen" in the Admiralty charts), on the 3rd of July, and some of the men killed two goslings with stones in Wiide Bay on the 19th. At Green Harbour, in Ice Fiord, on the 8th of September, we saw several large flocks of brent geese at considerable heights in the air, flying towards the sea. One morning, when we were in Mossel Bay, we were roused by the watch at an unusually early hour, who announced that there were twenty or thirty deer by the shore washing themselves in the sea. Field-glasses and telescopes were brought to bear upon the dark moving objects, and two boats were lowered immediately to take ashore the three eager sportsmen and the captain, all anxious to secure some of these, the first reindeer we had met with. Ascending to the crow's-nest soon after they had left the ship, I saw through the ship's glass what was taking place, and anticipated the results of the drive. It was evidently nothing but a wild-geese chase; so I made my way down

and announced that there would be no venison for breakfast that morning. After they had rowed some miles, the hungry sportsmen returned empty-handed; but they had *seen* the geese. This was not the only time that they were imposed upon by rein-geese, though never again to an equal extent. So it seems not improbable that it may be owing to mistakes of this kind occurring now and then that the brent goose in Spitsbergen is distinguished as the rein-geese.

Bernicla leucopsis, Bechst. (Bernicle Goose).—Prof. Nordensköld shot a specimen of this goose in Bell Sound in 1858. It was eaten up by the Expedition. We started on the evening of the 22nd of July (James Kidd and I) to visit a lakelet on the hills opposite Diana Island. Mr. Potter had reported the previous night that there were some queer-looking birds upon it, such as he had never seen before; and Mr. Leigh Smith said that in 1872 some of the same kind were found there by him; but they had not shot any. On our first arrival at the edge of the lake we could see nothing but a pair of redthroated divers swimming, and we therefore concluded that either these were the birds we had come so far to see or that the strangers had departed. In a minute or two, however, we found that they had not gone, for there they were putting off from the shore at the other end of the water—a dozen or more of bernicle geese. Our plans were formed at once. Kidd took up a good position half way down one side of the lake; I manœuvred with a very ugly dog on the other. After much shouting, stone-throwing, and violent gesticulation on my part, and a good deal of running about on the part of the frightful cur, the whole line of the geese was driven within range of Kidd's gun. He gave them a warm salute. Six birds and a half were placed *hors de combat* at his first discharge; another barrel completed the slaughter of the seventh. The astonished survivors betook themselves with all haste to a remote corner of the lake, and did not once take their eyes off Kidd while we were waiting for the dead to be floated ashore. As soon as they had seen us to a distance in one direction, they ran off as fast as their legs would carry them the other way, without stopping until they reached the sea. I saw them there, through a telescope, the next day but one. Directly they saw me approaching within a mile of them they paddled out to sea at full speed, looking round as they went to make quite sure that they were not being pursued. If they could have flown they

would; but moulting put flight out of the question completely. We placed the dead *en cache* out of the reach of foxes under a heap of heavy stones, and then continued our walk in the direction of the mountains, expecting to find some good plants near the glaciers. How Kidd fired at a longtailed skua, and we watched a black fox pursuing a ptarmigan, has already been related,—so I need not repeat it here. Beyond a stiff climb up some cliffs, in which Kidd after reaching the top by one route had to descend again and follow mine on account of his progress being brought to a full stop by an impending cornice of ice, we had little further adventure. These cliffs were the resort of roches, although they were a long way from the sea, and high above it.

Harelda glacialis (Longtailed Duck).—This duck occurred in King's, Wiide, Treurenberg and Lomme Bays. In the first of these localities a duck and drake were shot right and left by Lieut. Chermiside, but only the duck was secured.

Somateria mollissima (Eider Duck).—Most of the eiders breed on islands which for the time being have no ice-communication with the mainland capable of being traversed by foxes. I am inclined to doubt the statement sometimes made by writers that the drake is in the habit of supplying down for another nest, should the first nest, upon which the duck's down is expended, be robbed. If it is really the rule, it is one which does not always obtain. For amongst the many examples brought on board I did not find one drake with its breast denuded. On the other hand, we noticed many second nests, none of which had the appearance of having the whole down of a drake in them: they all looked very shabby, as if the duck had been obliged to put up with anything that she could get. Such as had any down in their composition had much less than the standard amount, and that was largely adulterated with an admixture of foreign matters. If it was on the beach, the down was eked out with sea-weed; if elsewhere, with moss. Sometimes ducks were reduced to laying their eggs on the bare ground without any sort of packing whatever round them. In addition to these facts, it should be considered that the eider drake seems to take no share in the work of incubation. We saw none but ducks on any of the nests found by us. The drakes, whilst the ducks are sitting, flock together like rein-ganders on the water—only on the sea, and not on lakes as they do. And in the absence of any abnormal condition of the subcutaneous circulation, such as predisposes birds

to incubation, and the down to become easily detached from the breast, why should the drake's down come out? At Green Harbour, on the 8th of September, Kidd and I saw families of eiders on the water, which were all, both old and young alike, in the condition of flappers incapable of flying.*

Somateria spectabilis (King Duck).—None were shot; but Lieut. Chermiside said he saw some at South Gat, Wiide Bay and Lomme Bay.

Colymbus septentrionalis (Redthroated Diver).—This species is of not infrequent occurrence in Wiide Bay, where we found it breeding in lagoons and freshwater lakes. It occurred also in Treurenberg Bay. The nest is usually placed in quite a shallow place about a yard from the water's edge. It consists of a large heap of moss fished up from the bottom, with a slight hollow on the top, and no lining. In one nest I found a few leafy shoots of cotton-grass (*Eriophorum capitatum*). Both of the nests taken by me contained a couple of eggs; from a third a pair of young ones swam away at my approach.

Cephus Mandti, Licht. (Mandt's Dovekie).—This dovekie is a bird which is regardless of time and distance. No niche is too high up in the cliffs, no cliffs too far from the shore, for a nest, in its opinion. Provided it can get a comfortable crevice somewhere for its eggs, it is contented. The situation may be two yards or two miles from the waves, it makes no material difference to the bird. He cannot well miss the way to it, for there is perpetual light; he has only to fly long enough and far enough, and he is sure to get there sooner or later. Some of their old breast-feathers are now and then inhabited by colonies of a minute mite, which give them the appearance of being blood-stained, with the dried blood nearly rubbed out.

Uria Brunnichi, Sabine (Brunnich's Guillemot).—No wild bird can well be more indifferent than the loom to the presence of man. You have only to shout at them when they are fishing, and make as much noise as you can, if you wish to bring them within reach of the oars. Captain Fairweather shot numbers of them from a boat at this distance while I was with him. He was much

* Professor Newton tells me that the Swedes have distinguished the Spitsbergen from the Scandinavian eider; and that this last has been separated from the North American. He does not know whether the American differs from the Spitsbergen form.—A. E. E.

surprised, when his gun went off, to find that it had only about as much effect as his rifle upon them, there being a current tradition on board that on a former voyage Mr. Smith had killed forty at once by firing right and left into the crowd which had collected round the boat to hear him shout. That, however, was a mere nothing, though quite true. At Alk Range, in Hinlopen Straits, there were so many of them in the cliffs that we could have filled a whale-boat with them if we had pleased without firing a single shot. The range is about three-quarters of a mile in length, three or four hundred feet in height, and is a series of sheer precipices full of ledges full of birds. A man had only to climb up to a ledge, and he could catch as many looms as he wished with his hands, taking hold of them one after another by the neck. A few perhaps might fly away whilst he was occupied with their neighbours next door; but if he only sat down a minute or two they would come back and alight within his reach. We in the boat would be below picking them up as fast as he could throw them down to us, sometimes varying our occupation by making raids with poles and boat-hooks, as we stood in the boat, upon such ledgesful of birds as were within eight or ten feet of the water. They did not take much notice of us. It was astonishing to see how many pokes and raps upon the head a loom would bear before it would so much as condescend to look at us, or make an attempt to fly. Some would not stir an inch, do what we would, while poles were rattling against the rocks within an inch of their faces. Others now and then took headers into the boat, where they soon became very quiet, or shooting just clear of it fell into the midst of seal-clubs and sticks that were guarding the approaches to the sea. Seldom was a diving bird secured; the only chance of making sure of them was to prevent their reaching the water. To cut matters short, in the course of an hour or two we sailed from the cliffs with five or six dozen of the looms, and about as many of their eggs in the boat. They were wanted for food; that was our object in killing so many: for if the skin be removed before they are cooked their flavour is excellent. From Alk Range these birds were in the habit of flying to Lomme Bay (which is doubtless named after them), and even farther up the Straits, to fish, travelling together in flocks of from forty to two hundred or more. These flights passed over us in rapid succession. Outside the southern entrance to the Straits we saw upon another occasion an immense concourse of looms fishing.

They seemed to be diving far beneath the floe, coming up obliquely like rockets from under the ice with unusual velocity on their return to the surface, as if they could not have held their breath another moment. Fortunately we had no Good Templars on board, for they would have displayed more than their usual acerbity at seeing the looms; for they are birds to which Artemus Ward's definition of babies is strictly applicable,—beings completely destitute of all moral and religious feeling, strongly addicted to drink. Their powers of imbibing are enormous; they are always sipping; and the water they sip is not plain water, but water with something in it—fermented liquor, no doubt, for it is obtained from “the yeasty waves.” And yet they are never the worse for it. This last consideration, together with the fact of the liquor costing nothing, would fairly drive the teetotaller wild, for his favourite pleas for abstinence would be taken out of his mouth, and he would not have a word to say against the besotted creatures. It speaks much for the morality of the British sailor, that his indulgence in drink comes far short of the habitual excess of the looms and dovebies. Even so long ago as Lord Mulgrave's Expedition, he seems to have made no complaints about the meagreness of the allowance of liquor served out to him; and yet such was the parsimony of the Naval Administration at that time that they only allowed each man one bottle of brandy and a gallon of beer per diem on board His Majesty's ships in Greenland (*i. e.* Spitsbergen).

Mergulus alle (Little Auk).—The rotche when it flies has always the appearance of being rather behind its time; it seems in such a tremendous hurry, and starts off with its mouth crammed full of food, as if it had been suddenly called away in the middle of dinner. You may see a party of them on the water—six or seven birds—take wing together to return to their nests. You think they are all gone, but you are wrong; for without pausing for an instant to see whereabouts they are, Nos. 8, 9 and 10 come flying up from under water one after the other, and take after the others at full speed. People in former days suspected them of being subject to *goitre* during the breeding time; but a little observation showed them that the birds kept small aquaria in their mouths rather overstocked with shrimps to be exactly healthy for the shrimps.

Fratrercula arctica (Puffin).—The following are places where we found the Greenland Parrot familiarly designated “Tommy Noddy”:—the Western Ice; Table and Walden Islands; Lomme,

Treurenberg, Wiide, and Foul Bays; Norway Islands (commonly); Dane's Gat, Magdalena Bay, off the Seven Glaciers (Ice Mountains in the chart; in old charts, Icebergs), Green Harbour and off South Cape.

From most of the Spitsbergen species of birds I obtained Anoplura. These will be included in a list of the Articulata collected by me in the course of the voyage.

FISHES.

Addition to the Fauna:—*Raia radiata*.

Salmo alpinus.—This char is abundant in deep clear fresh-water lakes in Spitsbergen. The waters inhabited by it are usually coated with ice until quite late in the season; and when the ice thaws round their edges the young salmon may be seen here and there basking amongst the rocks in the shallow water. At the first alarm away they dart under the ice, or hide themselves between the stones; for the bottom is rugged and stony, not silted up with glacier-mud, in the lakes they live in.

Gadus carbonarius.—Found in cod at Green Harbour by Capt. Walker. Cod were so plentiful there that he caught, by jigging, upwards of four tons of them, at the rate of a ton a week.

Boreogadus Fabricii.—This is the *Merlangus polaris* of arctic literature. It is common in Magdalena Bay, and in the ice of the Arctic Seas, where looms and kittiwakes prey upon it largely. As summer advances the floes become more and more rotten, until at length their structure under water resembles, on a very exaggerated scale, masses of *gruyère* cheese, the cavities being often large enough to admit a man's leg. *Boreogadi* may be seen occasionally swimming near the surface in the crevices and open lanes of water between the floe-pieces. Whenever danger threatens they hurry into the nearest ice-grotto, and take shelter in its deepest recesses. We saw a good many of them underneath the young ice in walking across the floe to Phipps's Island in September, and secured a few by breaking in upon them with an alpenstock. But most of our specimens were obtained a few days before when we were some miles to the eastward of the Seven Islands. We were beset there a short time, and eventually had to force a passage through the ice on the first favourable opportunity: this was presented one morning by a movement which set in amongst the ice, and caused the floe-pieces closely joined together to part slightly asunder.

A suitable opening being selected, the ship, which had been lying under steam during the whole of our besetment, was immediately got under weigh and forced into it to make it wider. When she could proceed no farther for the time being, she would be backed astern for some hundreds of yards, and then be brought up again at full speed right on to the ice, breaking it up along the crack for several yards ahead of her, and making on all sides a great commotion among the floe-pieces, whilst all hands kept "overing" to make her roll, in order that the passage might be widened to the utmost. Two or three of us, in the mean time, would get out upon the ice with poles and boat-hooks, ready to clear the loose ice away so soon as she might retire for another ram. It was surprising to discover what extensive pieces of heavy ice, many feet in thickness, one man unaided could shove through the water. When the ship had got far enough back, and was now returning to the charge, we had to look out for ourselves, withdrawing half a dozen yards or so from the edge to await her onset. Onwards she would come, bumping a few loose pieces out of her way, grating along the sides of the narrowing crevice plump upon the ice. Large masses slowly rearing up on end pressed down by her keel; pieces thrust forwards by her bows over-riding one another; cracks opening under our feet in all directions everywhere resounding; and the grinding of the pieces one against the other as she gradually forced them aside, frightened the wretched Boreogadi out of their lurking-places; and the surging waters cast them helpless on the ice.

Cyclopterus spinosus.—This lump-fish was trawled up in Magdalena and Lomme Bays by Captain Walker.

Liparis Fabricii, Kroyer.—Two from Magdalena Bay by Capt. Walker.

Icelus hamatus.—One taken in Magdalena Bay by Captain Walker.

Cottus tricuspis, Reinh.—Common in Magdalena Bay.

Cottus scorpius.—One specimen was obtained at Green Harbour. Dr. Günther, who identified all the fish for me, noticed that it had sixteen soft rays in the dorsal fin.

Raia radiata.—A specimen taken in Capt. Mack's (of Tromsö) white whale nets was picked up by us on the shore in Lomme Bay.

Diallatias microcephalus.—In 1872 sharks in Wiide Bay came up after some bear and deer skins which were being towed astern of the 'Samson.' A few of them were caught by her crew.

In continuation of these "Notes on the Spitsbergen Fauna," lists of the Articulata, Mollusca, Cœlenterata and other animals will be published elsewhere. The Flora will be dealt with in a similar manner. The plants are being determined at Kew and in Sweden. Whatever has to be said about the Geology may as well be disposed of here. The only original observation of any interest made by me was that the strata of the north-easterly extremity of Hope Island are identical with the shales containing fragments of plants, of Green Harbour. We observed nothing else whatever, but what Prof. Nordenskjöld and his colleagues had already made out. The extensive mineralogical collection which some of the daily papers stated we had formed, unhappily existed only in the reporter's imagination. Before we sailed from England I was asked at Cambridge to leave the mineralogy of the mainland of Spitsbergen alone, and to devote my time to plants and animals. After they have been determined, the specimens will be deposited at the Kew, British, Cambridge and other Museums, so far as series of duplicates admit of several sets of them being made up.

A. E. EATON.

Croydon, October 13, 1873.

Ornithological Notes from West Sussex.

By W. JEFFERY, jun., Esq.

Glaucous Gull.—January, 1873. As noticed on other parts of the coast, the glaucous gull paid us a visit: on the 15th I saw an immature bird in the flesh at Chichester, which was killed at Selsey. Two specimens had been obtained for the Chichester Museum a few days before: these I saw after they had been stuffed. I also heard of a fourth specimen obtained, and of others seen, but not killed. These appear all to have been in immature plumage. An adult female, now in my collection, was killed at Selsey on the 15th of January, 1870.

Hawfinch.—During the month of February hawfinches were met with in considerable numbers in many parts, where they appear to have been almost unknown before.

Oystercatcher.—I think the oystercatcher would have been better named "cockle-catcher," or rather "opener." I have before found cockles in the stomach of this bird, and on the 22nd of February the stomach of one, on dissection, proved to contain as many as

ten; and as proof that they obtain their food naturally, by opening the shells of these and other bivalves, we find the bill so lengthening by growth at the points of the mandibles as to be inconvenient to the bird, when kept in confinement. (See Zool. S. S. 335.)

Common Sandpiper.—August 2nd. Seen on the muds of our harbours in parties of five or six.

Sanderling.—August 2nd. Seen in flock; some appear to have remained the whole summer with us. They frequent either the sand-banks which are covered at high tide, or the shingle on the shore washed by the tide.

Temminck's Stint.—I had the good fortune to obtain a pair of these diminutive sandpipers, in a marsh adjoining Pagham Harbour, on the 25th of August. I had scarcely a view of them when they first rose; but as the "native" who went with us said they were only "wagtails" (the name given to the common sandpiper there), I did not follow them; for the sake of a shot at something, my companion did; he killed one, and I saw at once that it was a Temminck's stint, and on going back obtained the other without much difficulty. They seem to have similar habits to those of the so-called "wagtail" (*Totanus hypoleucus*).

Little Bittern.—In August or September a little bittern was killed at Nutbourne and sent to Chichester for preservation. I did not see it, but have good authority for the statement.

Snow Bunting.—October 29th. Had a snow bunting, in the flesh, given me, which was killed at or near Sidlesham; several others were obtained about the same time.

Goldcrest.—This species seems to have been met with in unusual numbers south of Chichester about the end of October. This is a district not much frequented by them; several were, I hear, knocked down with sticks and stones, and sent to Chichester for stuffing. I noticed about this time several little parties of goldcrests passing through my garden.

Richardson's Skua.—On the 5th of November I saw a bird of this species, in the flesh, at Chichester. The length of wing, from carpus to tip, was fourteen inches. The neck had the hair-like yellow streaks described by Yarrell appearing on the sides, and one of the central pair of tail-feathers extending about three inches beyond those on either side; the other was missing.

Buffon's Skua.—About the beginning of October I saw a skua, also in the flesh, which had been killed at Donnington, near

Chichester, while flying over some fields, and I again to-day (November 5th) saw the remains of the skin, which had been partially destroyed while in the birdstuffer's hands, and on measuring the wing as before, found it to be just twelve inches. The bird was in mottled plumage, the central pair of feathers an inch beyond those next.

Stone Curlew.—November 5th. A backward bird of the year killed on the hill-ground near here with down still attached to the feathers of the forehead.

Autumnal Migrations.—Tree pipit and yellow wagtail heard passing over from the 5th of August to the end of the month, and both species were numerous during the first few days of September. The tree pipit breeds sparingly in some of our wooded parts; but the yellow wagtail is unknown here in the breeding season. By the end of August most of the warblers have left; an occasional common whitethroat or willow warbler seen. The first week in September, whitethroat, willow warbler (or chiffchaff) and flycatcher seen; on the 4th a solitary swift. Whinchats numerous on the 5th; wind N.W.; none seen next day: a nightjar seen in a nursery garden. 6th.—Gray wagtail reappears from breeding quarters. 7th.—Chiffchaff, whitethroat and flycatcher seen. 11th.—Dabchick returns. 15th.—Chiffchaff sings. 19th.—Lesser redpoll reappears; chiffchaff and flycatcher seen; tree pipit heard. 23rd.—Reed and sedge warblers and chiffchaff seen. 29th.—Meadow pipit passing in flock. 30th.—Pied wagtail passing in flock. Saw from twenty to thirty swallows in company on the 4th of October, and on the 5th several chiffchaffs; on the 12th missel thrushes congregate, and on the 26th saw and heard a small party of fieldfares at Fareham, in Hampshire: I notice this is three days earlier than this species was observed in Surrey (see Zool. S. S. 3790).

W. JEFFERY, JUN.

Ratham, Chichester, December 6, 1873.

Bird Notes from the West.

By the Rev. MURRAY A. MATHEW, M.A.

Honey Buzzard.—About the middle of June a young male honey buzzard was shot at Cothelstone, on the Quantock Hills. This is the first occurrence of the species, as far as I know, in the county

of Somerset. Another was seen at the same time, and was probably the large hawk which I noted a few weeks later during an evening walk on the hills.

Late stay of Swifts.—All the hirundines were late in arriving in this neighbourhood last spring, and some of them were equally late in their departure in the autumn. The 10th of August is the average date for swifts to leave us, but this year I observed several as late as the 5th of September. Martins were flying about in the village as recently as November 26th. On the 23rd of November I saw many on the coast of North Devon, the weather at the time being very cold, with a keen east wind.

Early Woodcock.—In the beginning of October I was shooting in the centre of Devonshire under the northern slopes of Dartmoor. We flushed and bagged a very fine woodcock on the 4th of October, the earliest date on which I have seen one. In this part of the country wood larks were very numerous, seeming quite to take the place of the sky lark, which was scarce by comparison. I noted little parties in almost every field. Goldfinches were also plentiful, and this pretty little finch in many parts of the kingdom has almost disappeared.

Buffon's Skua.—About the middle of October an immature specimen of Buffon's skua was obtained by Mr. Haddon, watchmaker, of Taunton. Mr. Haddon has a collection of British birds, all of his own shooting, and is notorious for the good luck which attends him whenever he takes gun in hand. He shot the Buffon's skua on the north coast of the county, a little to the west of Bridgwater.

Abundance of Snipe and Wild-fowl.—Towards the middle of November I visited the north coast of Devonshire for a few days, and, the wind being in the east, there were then a number of snipe and wild-fowl in the marshes. Directly the wind shifted they were all off again; the snipe probably to the hills. When wild-fowl rise alarmed from a pool out of range it is always advisable to crouch immediately, as the birds, after taking a few casts, will very often return to the pool from which they were started, and, if they do not settle quietly again, will very likely fly low overhead, affording a good shot. I twice proved the advantage of these tactics on my late visit to the coast, the first time dropping a shoveller duck out of a flock of ducks which had risen wild out of distance, but which, after a few circles in the air, flew close to me in an

attempted return to their pool. And here a word in praise of the flavour of the shoveller, which is quite equal to that well-known delicacy, the teal, if it does not even surpass it. At the margin of one of the duck-ponds I noticed a wood sandpiper and a spotted crake, and thought it a late date (November 19th) for both.

Knot, Golden Plover.—On the sands I saw a small flock of knot; and often in the air noted flocks of golden plover flying inland. Some of these flocks were very large, and must have contained several thousand birds. At times golden plovers were to be found on the flats, but were wild and difficult to approach: An old gamekeeper told me that the best time to get near these birds is at daybreak, when they are busy feeding, and in the dim light will then permit an easy stalk. At any rate, his theory held good in practice, as when we came down to breakfast in the morning he would sometimes appear with a good bunch of plovers which he had shot on the moor while we had been still in bed.

Common Buzzard.—Some time in November a very fine example of the common buzzard was shot on Cothelestone Hill—the same place which produced the honey buzzard last June; and two more have since been trapped by the keepers. It is sad to hear of such havoc being made with an interesting species which will soon be extinct in these islands.

MURRAY A. MATHEW.

Bishop's Lydeard, December 4, 1873.

Ornithological Notes from Devonshire, Cornwall, &c.

By JOHN GATCOMBE, Esq.

(Continued from S. S. 3788).

NOVEMBER, 1873.

1st. Many woodcocks and snipes in the Plymouth market; the former were, I should say, rather plentiful in the western counties, judging from the numbers I have seen at the poulterers.

3rd. Visited the neighbourhood of Warleigh Woods, in which there is a heronry, and was much interested in watching many herons settled on the fir trees near the river, waiting for the tide (which was very high at the time) to recede, so that they could recommence fishing. Herons have certainly increased in number lately in this locality.

Nov. 4th. Several swallows passed close by me on the coast at Plymouth, flying due west. Observed a common redshank in the market—rather late for it in this neighbourhood.

5th. There was a large quantity of curlews, dunlins and ring dotterels on the West Mud this morning, which I watched with a telescope, and observed a great blackbacked gull, in adult plumage, the first I had seen since the spring. Blackbirds and thrushes are now very plentiful in the county, and I am sorry to say also in the markets.

8th. Observed a fine old male black redstart on the rocks of the coast close to Plymouth, which was very shy, and constantly hid itself in caverns: it was in fully adult plumage.

12th. Wind east, very cold and raw. Observed for some time a house martin flying to and fro under the lee of the houses in Durnford-street, Stonehouse, hawking for insects, but its flight was very feeble and slow.

15th. Wind still east. Remarked three house martins flying up and down under the lee of some houses at Millbay, Plymouth.

16th. Found kingfishers very plentiful on the coast and up the estuaries, and many are almost daily brought to the birdstuffers' shops. One man boasted of having killed thirteen during the last few weeks, but, finding that they were not worth much for stuffing, said he thought he should not kill any more. I have observed kingfishers, lately, when flying along the coast suddenly stop and hover, kestrel-like, over the pools among the rocks, and on one occasion over the sea, but close to the shore: this habit is, of course, commonly observed on fresh-water rivers and ponds.

17th. Watched a flock of twelve longtailed tits on some trees quite in the town, and have seen others lately on the cliffs along the coast, especially those covered with small trees and furze-brake. I am glad to hear that there are some black grouse still on Dartmoor, having seen one this morning, at a birdstuffer's shop, which had been killed by a friend of mine on the moor, not far from Plymouth.

18th. Saw the old male black redstart again. This morning a martin was observed flying near the Plymouth Hoe.

20th. Some gray plovers were seen on the Plymouth Breakwater, and one killed. Some fieldfares were also observed by me near the town—no doubt driven in from the moors by the strong north winds.

Nov. 21st. Swallows and martins seen flying over Plymouth. Many water rails, moorhens, teal, snipe, and female goldeneye in the market.

22nd. Observed a young black redstart on the rocks at the Devil's Point, Stonehouse.

24th. A great northern diver in the Sound, and an abundance of woodcocks in the markets, also many teal.

26th. Blowing very hard from the north. A storm petrel seen in the harbour at Plymouth.

27th. I observed an adult Iceland gull in the Sound, no doubt driven in by the prevailing northerly gales. I also remarked a northern diver and many shags, which latter birds have only just now made their appearance on our part of the coast, after the breeding season.

Herring Gull carrying off a wounded Dunlin.—Some friends of mine, on whose accuracy I can fully depend, told me that when shooting in the Sound a few days since a wounded dunlin, which had fallen into the water, was pounced upon and carried off by a young herring gull before they could reach the spot in their boat. I have often heard of falcons carrying away wounded birds, as it were, almost close to the sportsman's nose, but I do not remember in all my shooting excursions on the water having myself witnessed such a feat performed by a gull of any kind, although I have not the least doubt such was the case, since Mr. Thompson, in his 'Birds of Ireland,' mentions instances of the great blackbacked gull having frequently attacked, and carried off even, wounded wigeon from the wild-fowl shooters in Belfast Bay, and that some gulls have been known, falcon-like, to strike down birds out of a flock.

Ferocity of a Jackdaw.—I must now relate an instance of ferocity lately observed in a jackdaw. A friend of mine living in Plymouth, being in the habit of daily feeding a number of sparrows with crumbs thrown from his breakfast-room window, some jackdaws generally participating in the feast, saw one of these birds deliberately seize a poor little sparrow by the back of the neck, shaking it as a dog would a rat, and notwithstanding the tremendous hubbub kicked up by the victim's brethren, succeeded, before my friend could rush to the rescue, in carrying it off, followed by the whole mob, to the "shoot" of a high house, where no doubt it was ruthlessly destroyed.

Hobby near Plymouth.—In my last notes I omitted to mention that a fine young hobby was killed, on the 1st of October, in the neighbourhood of Plymouth.

JOHN GATCOMBE.

8, Lower Durnford Street, Stonehouse, Plymouth,
December 7, 1873.

Female Roedeer with Horns.—On the 31st of October I killed a roedeer, and was surprised to find, on handling the deer, that it was a female with the head of a buck. The horns were short and soft, the same as if they had been ten or twelve days cast and had begun to grow again. The deer had also a great deal of milk upon her, but no other deer of any kind could be found near the place, although the ground was all disturbed. Is not this a very unusual and curious circumstance? The same thing never happened to me before (and I have had some experience with roedeer), nor others to whom I have mentioned the circumstance.—‘*Field*,’ November 8, 1873.

Food of Water Shrew.—On the 26th of July I watched a water shrew diving for food, which it landed in order to devour. After watching for about a quarter of an hour, during which it rarely had an unsuccessful dive, I made a search in order to ascertain on what it was feeding, and found it to be the caddis-worm, which it seemed to remove from its domicile with ease. At the place where it landed I found quite a heap of empty cases.—*W. Jeffery, jun.; Ratham, Chichester.*

Dormice Breeding in Confinement.—I had occasion to-day to visit the establishment of Mr. Nicholson, naturalist, of High Street, Portsmouth, and was rather astonished to see about twelve or fourteen small cage boxes, each containing the female and young of the common dormouse (*Myoxus avellanarius*) in all stages of development, from the naked, blind little thing of a few hours old to the full-grown animal, with its beautiful eyes, ruddy coat and amusing activity. Mr. Nicholson has upwards of two hundred, all bred and born in confinement, in litters or nests of from three to eight or nine young ones. Did a similar instance ever come under your observation?—‘*Field*,’ November 8, 1873.

Birds observed at Glenarm Castle.—On the 18th of October a fine specimen of the common buzzard was shot near Glenarm; weight thirty-two ounces; contents of stomach, the remains of a rabbit. It is the fourth I have seen shot in this neighbourhood, two of which are in my own collection. On the 20th of October (wind blowing a gale N.W.) a specimen of

the little auk was taken alive near the coast: weight, three ounces and a half; plumage black and white; the sides of the head are white, above the eye a small white spot; scapulars with white streaks; secondary quills tipped with white. House martin last seen on the 8th of October. Snow buntings first seen same date.—*T. Brunton; Glenarm Castle, Larne, Ireland.*

Note on the Longevity of the Royal Kite.—In the 'Zoologist' for 1865, Mr. Roocke recorded two remarkable instances of the longevity of the royal kite, to which I am desirous of adding a third, less remarkable than one of the cases mentioned by Mr. Roocke, but yet perhaps worthy of notice. In the summer of 1846 I purchased, whilst in Cardiganshire, a young kite, which had been taken a few weeks previously from the nest at the "Devil's Bridge," in that county, and kept it in confinement till the 3rd of December, 1873, when it was found dead in its cage, without any previous illness having been observed, except some slight lameness in one leg. This kite was a female bird, and laid two eggs in April, 1862. It may be worth mentioning that on one occasion when a full-grown dead slow-worm was offered to this kite, the bird seized it with avidity and swallowed it whole.—*J. H. Gurney; Northrepps, December 13, 1873.*

Buzzard, Hobby and Peregrine near Newmarket.—A buzzard was taken near here last week, and a hobby was trapped on the 26th November on the Warren; when found it was unfortunately too far gone to be preserved. A peregrine falcon was also shot last week at Southminster.—*William Howlett; Newmarket.—'Field,' Dec. 6, 1873.*

Fieldfares feeding upon Apples.—Anything unusual in the habits or economy of birds must be interesting to naturalists; on this ground therefore I am induced to record a raid upon my orchards by fieldfares during the present autumn. My friend Mr. F. Bond has suggested to me that perhaps the usually earlier clearance of the apples from orchards may account for this fact not having been noticed before; but this suggestion appears to be effectually disposed of by the counter-fact that in the year 1870 my orchards were unvisited by even a single fieldfare, although the apples (a larger crop than in the present year) were left out until within three or four days of the date when lately cleared. The crop was got in by the 12th of November in 1870, and by the 16th of the same month in the present year. The fieldfares first made their appearance about the 1st of November, and were remarkably bold for a bird of such proverbial shyness; they were in considerable numbers, and the quantity of fruit quickly scooped out by them was quite a caution. Wishing to scare them, as well as to obtain some fine specimens for preserving, I found no difficulty in getting repeated shots any day, until the last apple was got in. I should mention also that in 1870 scarcely a single blackbird or thrush attacked the apples, while this year these birds were literally in hundreds, being far more

numerous than the fieldfares, and the damage done of course far greater; it was also much more difficult to get shots at them than at the fieldfares. Whether the excellence of the roast made up for the damage done is doubtful; both the blackbirds, however, and fieldfares were remarkably fat, and by no means contemptible as a second course. I can account to myself for the fieldfares not visiting me before, for they may not have found out the apples before, the orchards being rather removed from the arable lands where fieldfares usually haunt; but I cannot so account for the blackbirds and thrushes attacking me more this year than in 1870, when, as far as my recollection goes, they were at least as numerous as now. Quite independently of numbers, I am convinced that many birds must be under the influence of some cause or other by which they become, or cease to be, pests, in what appears to us an arbitrary and unaccountable manner. Thirty years ago, when I am sure the blackbirds and thrushes were quite as plentiful here as they are at present, there was not a net ever used to protect fruit of any sort, and all sorts of fruit were proverbial in their abundance; gooseberries unnetted hung on the trees until dead ripe, whereas during the last ten years not a single dish of strawberries, currants or gooseberries would have ripened but for close netting. So again, with respect to the damage done by bullfinches, I have for several years been compelled to defend myself by shooting them; nothing else practicable is effectual, but thirty years ago no one here ever dreamt of shooting a bullfinch, and yet scarcely a fruit-bud (except of greengages and some other kinds of plum) suffered; certainly the gooseberry bushes were never completely stripped from top to stem as they are now. During the last winter these birds, for the *first time on record* here, attacked the apricots, peaches and nectarines on walls, completely stripping many of them of fruit-buds. Whence arose this new form of their destructive propensity? and will it continue in future seasons? If we may credit Mr. F. O. Morris, the bullfinches of Yorkshire are quite unobjectionable garden visitors in the early spring mornings; and also (if I remember rightly) Mr. M. finds no need of nets even to protect his strawberry beds. Will the Yorkshire birds degenerate in course of years, or will birds of Dorsetshire amend their ways?—*O. P. Cambridge; Bloxworth Rectory, December 8, 1873.*

Ring Ouzel, &c., at Exmouth.—On Sunday, the 26th of October, as I was taking a walk with my son on the cliffs near Exmouth, we came across a few late stragglers. We came upon the place where some bird had been killed by a hawk; we could not at once identify the feathers of the slaughtered bird, but, after a little, we came to the conclusion that they were those of a young ring ouzel. Soon afterwards we saw two ring ouzels, both birds of the year: they were very tame, and allowed us to get quite close to them: we watched them for some time as they were feeding eagerly on sloe-berries. We also saw a flock of about twenty tree pipits

(which were probably congregating for their departure), one wheatear and one summer snipe; these were probably two late birds that had remained after their companions. Swallows and martins had apparently not begun to think of departure.—*Cecil Smith; Lydeard House, near Taunton.*

Black Redstart in Summer Plumage in November.—Since November 20th I have almost daily seen one or more black redstarts in their dark or summer plumage; I have never but once before seen them in such a dress. About ten or more years since I obtained a specimen, which I have still in my possession. A year seldom passes but they are seen here during the month of November in their less sombre but more plain plumage. To-day, whilst watching one through a binocular, I could but much admire its graceful flycatcher action of taking insects whilst on the wing.—*Stephen Clogg; East Looe, November 25, 1873.*

The Tawny Pipit at Brighton.—To-day I saw a male tawny pipit (*Anthus campestris*, Bechstein) stuffed at Mr. Swaysland's, which had been taken in a clap-net outside Brighton a few days back. It was in very good condition. Since I first pointed this out as a British bird ('Ibis,' 1863, p. 37), various other specimens have been obtained. The dates may be seen in Mr. Harting's 'Handbook,' p. 108; they range from August 17th to the present one, October 5th or 6th. We shall soon read what Mr. Dresser can tell us about this species, as the number of his 'Birds of Europe' containing it will be out shortly. I for one confess I have a good deal to learn respecting it as regards this country, where it seems to be found in autumn.—*George Dawson Rowley; Chichester House, East Cliff, Brighton, October 8.*—'Field,' October 11, 1873.

Short-toed Lark and other Birds at Brighton.—On Saturday, the 15th of November, a short-toed lark (*Aldaia brachydactyla*, Leister) was taken in a net outside Brighton, and brought alive to Mr. Swaysland, who sent it up to me. The bird, he says, is a male. On looking into my notes, I find two others have been seen here,—September 26, 1854, and April, 1858. The last was shot while dusting itself in a road, very near the spot where the present example appeared. Curiously enough, the man saw this example about, and went out on purpose to catch him. Mr. Harting, in his 'Handbook of British Birds,' notices Yarrell's bird, Mr. Rodd's bird (Zool. 1854), and two others in the 'Zoologist.' "The flight" took place this year with us on Sunday and Monday, October 26th and 27th, and continued more or less during the next few days, uniformly to the eastward. During the week a person took seven hundred birds of one species alone. On Sunday last, the barometer being very high, the air was swarming with gnats, and the martins (*Hirundo urbica*) were hawking for them as in summer.—*George Dawson Rowley.* [This is only the sixth recorded occurrence of the short-toed lark in the British Islands, all of which, with one exception, were captured in the South of England; the exception occurred

at Shrewsbury. The bird is a native of Central and Southern Europe, Western Asia and North Africa.—*Editor of 'Field,' Nov. 22, 1873.*]

Cuckoo in Confinement.—I hope Mr. Stafford will let the readers of the 'Zoologist' know how his young cuckoo prospers (S. S. 3788). On two occasions we have endeavoured to keep cuckoos in confinement, but in neither case has the attempt been altogether successful. In July of last year (1872) a farmer brought my sister a young bird, in North Lancashire, which he had found by a roadside near the nest where it had been reared. For several months it appeared to be in good health, but exhibited the same restlessness and longing to be away which Mr. Stafford mentions. It received the greatest attention at the hands of my sister, and for some time refused to feed itself. Caterpillars were its favourite morsel, which were always greedily accepted, but not devoured without ceremony. Picking them up crosswise in its bill, the cuckoo regularly proceeded to render them soft and digestible by passing them several times backwards and forwards between its mandibles; after which process they were swallowed head or tail first, as the case might be. Worms also formed part of cuckoo's diet, but were not received with the same relish nor eaten in the same careful manner. Throughout the winter soaked bread, egg and raw meat were its diet; but apparently this—or some other unknown circumstance—disagreed with it. In February or March of this year (1873) it lost almost all its feathers, and died on the 22nd of April, nine months after its capture.—*Hugh P. Hornby; 35, Norfolk Street, Strand.*

Late Stay of House Martins.—On the 22nd of November, and on several previous days, four martins were actively flying about the church-yard here; the night of the 22nd, however, was very cold and frosty, and on the morning of the 23rd, as I entered my church-door, one—no doubt, of these same birds—lay dead on the church-steps, evidently having died of exhaustion from cold. The other three were seen for several days longer, when I again found one dead not far off; since that the remaining two have disappeared; probably they, too, have died. Those I found dead were quite young, I should say not fledged for more than two or three weeks. I imagine that most of the over-late occurrences of martins and swallows noticed year by year are of very young birds, unequal to the task of migrating with the old ones.—*O. P. Cambridge.*

House Martin near Aylesbury on the 5th of December.—Yesterday, whilst walking with a shooting party at Hartwell, near Aylesbury, I noticed a house martin merrily hawking for flies for about half an hour.—*H. Harpur Crewe; Drayton Beauchamp Rectory, Tring, December 6, 1873.*

Scarcity and Late Stay of Martins and Swallows at Selborne.—I have two remarks to make with regard to the hirundines this year. The first is that they have been remarkably few in this neighbourhood. The other is the remarkable lateness of their departure. I received the other day a

letter from my friend Mr. Montague Knight, of Charston House, about four miles from hence, in which he says, "I saw some swallows here on the 12th instant, and yesterday (November 21st) was much surprised to see some six or seven house martins wheeling round the house. On both occasions the weather was bright and sunny. Gilbert White would have said they were attracted by the sun from their winter hiding-places." It is remarkable that White has no record of their stay later than the 5th of November.—*Thomas Bell; The Wakes, Selborne, Alton, Hants, Nov. 27, 1873.*

Martins and Swallows: is their Late Stay dependent on the Wind?—

Our local *Hirundinæ* left at the usual time for their migration; but on Sunday, the 9th of November, I saw a flight of about a dozen martins (*Hirundo urbica*), and noticed them daily from that time to the 21st. All this time the wind had been in the east, with the exception of a few hours at mid-day on the 13th, when it was due south. Every day a cold wind was blowing, the poor birds having apparently a hard time of it. On the 21st the wind changed to W.N.W., and became milder. On the 22nd, wind N.W., I saw but four martins and one swallow; 23rd, wind N.W., four martins only; 24th, wind W., all appear to have left; to-day (25th), wind S. and very mild, with fogs, I have walked for hours looking for swallows, but have not seen one, so conclude they have all left. On the 21st, whilst talking with a person who takes an interest in such matters, he told me that for a week or ten days he had observed the martins about, and the day before he had seen two swallows also. I was doubtful about the swallows; but whilst we were talking four martins and a swallow passed by, and I had full opportunity of recognizing it. The same person told me that he had heard that swallows would not start on their migration whilst the wind was at all from an easterly direction: the above facts would appear in some measure to corroborate the idea.—*Stephen Clogg.*

Indifference of Small Birds to the Kestrel.—I have been much struck by the indifference with which small birds seem to treat the kestrel. To-day (November 25th) I saw five linnets pass within a foot or two under a kestrel, whilst it was hovering in the air, without either noticing the other.—*Id.*

Partridge with white "Horseshoe."—Is it not very uncommon for the "horseshoe" on a partridge's breast to be quite white? I had one the other day with the "horseshoe" entirely white, with the exception of one little brown feather. It was an old bird.—*Henry Arrowsmith.* [Partridges, like many other birds, are subject to frequent variety. We have seen many more singular than this in appearance.—*Editor of 'Field,' Dec. 6, 1873.*]

Partridge perching in a Tree.—I was shown the other day a partridge which had just been shot while flying from a tree, in the top of which it had been perching. The gentleman who shot it told me that he had several

times met with similar instances in India, but never before in this country. I am aware that the circumstance is not unique, but it is perhaps of sufficiently rare occurrence to be worth recording.—*W. E. Hart; Kilderry, Co. Donegal, December 15, 1873.*

Virginian Quail in Northamptonshire.—I send you herewith a bird which I shot on the 1st of December, when out partridge shooting. Three of them were flushed from a hedgerow, and the one sent, being the nearest, paid the penalty. I have been a gamekeeper all my life, and have never seen a similar bird before; neither can any one here tell me what it is. I shall be glad if you will name it, and give me any further particulars in your power as to its rarity or otherwise.—*John Treeton; Gamekeeper to Baron Rothschild, Ashton, near Oundle, Northamptonshire.* [The bird sent is the Virginian quail or colin (*Ortyx virginianus*). As its name implies, it is an American species, which has been introduced into this country. A good many have been turned down at different times in the eastern counties, as well as at Windsor (by the late Prince Consort), and again in Scotland, but with little success. We have not previously heard of any in Northamptonshire; but, as the bird sent was shot near Oundle, we should not be surprised to hear that it was one of several turned out by Lord Lilford, whose enterprise in the cause of acclimatisation is well known to naturalists.—*Editor of 'Field,' Dec. 6.*]

A four-legged Chicken.—During the past summer a malformed specimen of the common fowl was sent to me as a curiosity; but, as it had been dead for several days, its preservation was impossible. It was a chick, and had lived several days; but it had *four* legs, two of which were in their proper place and were used in walking, whilst the other pair were placed much nearer the tail, and were both shorter and smaller than the natural legs. I need hardly state that the posterior pair were useless in walking. Some time since I saw a young duck exactly similar to the chick above mentioned, but that had lived for several weeks, and was accidentally killed.—*G. B. Corbin.*

Heron in Richmond Park.—Walking round Penn Ponds, Richmond Park, on Friday last, I had the pleasure of seeing fifteen herons rise from the bank of the upper pond, and alight in the covert near at hand, some of them perching on the topmost boughs of the largest trees. To a naturalist residing in town, and with few opportunities of seeing this bird, the sight was most interesting. Would they be likely to nest in the park if not disturbed? Their doing so would certainly add another charm to that already pleasant spot.—*'Field,' Dec. 6, 1873.*

Spoonbill in Guernsey.—Among the many rare and curious birds which visit the island of Guernsey in autumn may be noticed the spoonbill (*Platalea leucorodia*), a specimen of which was shot at the Vale a few days ago, and taken to Mr. Couch, taxidermist, College Street. This is the

only spoonbill taken in this island in the space of twenty-four years.—*H. T. Broughton*; *Denbigh Villa, Shanklin, Isle of Wight, October 21.*—‘*Field*,’ *October 25, 1873.*

Solitary Snipe in Lancashire.—A fine specimen of the solitary snipe, in beautiful plumage, was sent to me for preservation on the 23rd of September. It was killed near Garstang, Lancashire. The gentleman who shot it remarks, “It lay very close, and, on being flushed, flew steadier and slower than the common snipe, and, although but a little heavier than that bird, somehow presented an entirely different appearance on the wing. It uttered a note very similar to that of the common species.”—*John Shaw*; *Wyle Cop, Shrewsbury*. [The solitary snipe visits this country regularly every autumn, and always earlier than the common snipe. Instances of its occurrence here in spring are rare.—*Editor of ‘Field’*; *October 4, 1873.*]

Sabine’s Snipe in County Galway.—It may interest some of your readers to learn that a few days ago I shot a snipe of singular appearance, almost black, its feathers being as dark as those of a hen blackbird. This I imagine to be a unique specimen, never having met with a similar one.—*Algernon Persse*; *Rosborough, County Galway, Nov. 28.* [We have seen this bird, which is in the hands of Mr. Edwin Ward for preservation, and it is a very fair specimen of the so-called Sabine’s snipe, now generally regarded as a melanism of the common species.—*Editor of ‘Field,’ Dec. 6.*]

Hybrid Ducks Breeding.—The hybrids between the tufted duck and pochard which were hatched in the Pells at Lewes, and which I wrote about last year (November 23) have this year bred. One pair *inter se* laid eleven eggs in May last, but, being disturbed, forsook the nest. They laid again, however, and hatched seven on the 20th of July, but all the young except one were killed by moorhens. Another hybrid duck mated with both goldeneye and pochard, and reared a brood of seven on the 15th of June. The other three young ones of last year were not pinioned, and flew away, but are sometimes seen in the neighbourhood. The female pochard this year paired with her own mate, and reared seven young, which were hatched in May.—*J. H. Verrall*; *High Street, Lewes.*—‘*Field*,’ *October 18, 1873.*

Great Crested Grebe at Luton.—An immature great crested grebe (*Podiceps cristatus*) was caught in one of the streets of this town on the 15th of this month. The bird was not wounded in any way, but was completely exhausted, so much so that it scarcely made any effort to escape. With us it is a great rarity.—*T. Cane*; *36, Wellington Street, Luton, Bedfordshire, December 21, 1873.*

Glaucous Gulls in East Yorkshire.—I have just dissected two very fine old glaucous gulls obtained on this coast, near Flamborough. They were shot (the female on the 8th and the male on the 9th instant) by Thomas Harrington, a resident of that place, who informs me that though he has lived there all his life he never saw two adult birds together before. Young

birds are not uncommon. It is so seldom that the opportunity offers of comparing two adults of the opposite sex in the flesh, that I make no apology for giving full particulars. The male measured two feet six inches in length, five feet four inches from tip to tip of wings, and weighed three pounds ten ounces: its stomach contained fragments of sea-weed, a little gravel, and part of the milt of some kind of fish. The female measured two feet three inches in length, four feet nine inches in expanse of wings, and weighed two pounds thirteen ounces: stomach perfectly empty. Both birds were in excellent condition and fat; the female particularly so. Yarrell's description of the glaucous gull in winter plumage exactly accords with mine of these birds, unless I say, legs and feet *very pale flesh-colour*; claws dark horn-colour.—*F. Boyes; Beverley, December 18, 1873.*

Arctic Skua in Lincolnshire.—A bird of this species was shot at Grims-thorpe Park, Lincolnshire, a few days ago, and sent to me for preservation. Its length is fifteen inches. The centre tail-feathers are about four inches longer than the others. The colour on back of head is dark brown; back and wings ashy brown, inclining to black on quills and tail; under parts white. It was observed by one of the under-keepers frightening the fowls into their house, and afterwards it alighted at some meat belonging to a dog; here he left it while he went to acquaint the head keeper. On their returning together it was gone, but was soon afterwards observed to be coming straight over them, followed by about fifty crows, when it was brought to the ground by a shot from the head keeper's gun. I have never known one to be shot anywhere in this neighbourhood before.—*John Evans; Bourne, Lincolnshire.*—‘*Field*,’ November 8, 1873.

Large Snake at Godalming.—A snake was brought me this morning measuring four feet two inches in length. I have preserved it. The greatest lengths I previously recollect having measured are two feet nine inches and three feet three inches.—*William Stafford; Godalming, Surrey, September 10, 1873.*

A New Fish.—The genus *Fierasfer* of Cuvier, which, according to Günther, includes *Echiodon*, *Diaphasia* and *Oxybeles*, is distinguished from others of the Ophidiidæ by the absence of ventrals, the presence of pectorals, and having the vent at the throat. A fish evidently related very closely to this genus, and answering in each particular to the foregoing characters, but with the addition of a very prominent anal, having been kindly forwarded to me lately by His Excellency Major-General Lefroy, C.B., F.R.S., Governor of the Bermudas, I am led to believe, after careful examination of the specimen, that in the prominent anal it possesses a feature which may possibly require the establishment of a new genus for its reception, and

should such prove to be the case I propose to publish it as *Lefroyia Bermudensis*, in compliment to the gallant officer to whom I am indebted for the specimen.

Description.—Total length rather more than four inches and a half. Greatest depth at the vertical of the pectorals three lines and a half. The length of the head is slightly more than one-seventh of the total length. The greatest width of the head is rather less than one-third of its length. Body naked, attenuate, compressed. Facial outline rugose. Eye moderate; horizontal diameter of eye-cup one line and three-fourths; vertical diameter one line and one-fourth. Gape of mouth wide. Lower jaw shorter and received within the upper. Cardiform teeth of irregular size in both jaws, vomer and palatines; those of the latter largest. Branchiostegals seven, inflated, united below. Vent thoracic. Pectorals originating at the upper angle of the operculum, three lines in extent, and composed of very delicate soft rays. Dorsal indistinct, commencing in a groove about the vertical of the twentieth anal ray, continuous to caudal extreme, where, in conjunction with the anal, it forms a small filamentous tip. Anal prominent, commencing immediately behind the vent in advance of the vertical of the upper angle of the operculum, and extending to the caudal extreme. About its centre it is equal in depth to that of the body at the same position. Owing to the delicate texture of the fins, it is impossible to ascertain for a certainty the number of rays, but those of the anal exceed one hundred and forty. Colour when dried out of spirits golden yellow; the body transparent, showing the vertebræ within, a condition, according to General Lefroy, equally observable in life.—*J. Matthew Jones*.

Spawning of Flying-fish.—In some interesting notes on flying-fish in the October 'Zoologist,' by Mr. Gervase F. Mathew (Zool. S. S. 3737), he asks if it is known where these fish deposit their spawn? On this point I am happy to be able to supply some information, as I had an opportunity of observing them some years ago when at the Chincha Islands, on the coast of Peru. They made their appearance about the last week in March, and the water round the rocks was alive with them, the numerous fissures and crevices seeming all too few for their requirements. Looking down through the clear water, we could see a moving mass struggling for places, and respecting a long narrow rift, one of our sailors remarked that it was "just like the pit entrance on boxing-night." At first we used to take them with the "granes" alongside the ship; but we soon found this exertion was totally unnecessary, as enough for all hands could be taken with the hand from the fissures in the rocks: a few were also to be found every morning jammed in between the rudder and the post. I am well aware that it is not the "correct thing" to eat fish of any kind when spawning; but sailors are not fastidious, nor have those who pay fifteen shillings a couple for woodcocks in March and April, when they are breeding, any right to throw stones.

At *this* time of the year I never noticed these flying-fish “on the wing;” doubtless they were too heavy, but at other times I have, of course, observed thousands in various seas, and my experience respecting their flight entirely coincides with that so admirably expressed by Mr. Mathew. Not even the frigate-bird was ever seen by me to swoop at, much less to catch, one on the wing, and in ‘South Sea Bubbles’ either “the Earl” or “the Doctor” ridicules the very idea of any bird being able to do so, expressing at the same time his ardent wish that it were possible to train a frigate-bird or a tropic-bird (I quote from memory), and adding with a burst of enthusiasm, “What hawking I would have!” That there may be no mistake about the species, I may observe that I possess one of the largest “wings” procured on that occasion, dried and spread out in a book: it just goes in a large octavo volume, but is too large for ordinary octavo.—*Howard Saunders.*

Small Lumpsucker.—I have just received alive the smallest lumpsucker I ever saw or heard of. It measures barely three inches in length, and is of the usual dull leaden blue of this fish when not in first-class condition. It was taken in the open sea in about twelve fathoms water, and is exactly like its parents.—*Thomas Cornish; Penzance, November 20, 1873.*

Greater Forkbeard off Looe, Cornwall.—On Saturday, the 29th of November, a forkbeard was brought to me, which had been taken in a herring-net the night before. This being the only specimen I have ever seen, I sought for information in Couch’s ‘British Fishes,’ by which I found my specimen did not correspond with either of the figures given in that work, but that it bore resemblance to both the greater and blennoid forkbeards, having the gill-covers, eyes, beards and colour of the latter, with the pectoral, dorsal, anal fins and tail of the former, whilst the body was not so deep as in the figure of the greater, nor so slender as the figure of the blennoid. Not feeling satisfied as to its identification, I sent it on to Mr. Cornish, of Penzance, requesting his opinion, and in reply he says, “Your fish is the greater forkbeard. I have had it twice, and in 1864 I had a specimen which corresponded with Couch’s blennoid forkbeard. Mr. Couch and I wrote each other about it; and the conclusion I came to was that he was mistaken in supposing the fish to be of a distinct species, and that the blennoid forkbeard was merely a common one out of condition.” Although Mr. Couch gives a figure and description of the so-called blennoid forkbeard I think it is quite evident that he was doubtful as to its being a distinct species, and that he was inclined to defer to the opinions of Cuvier and Dr. Günther; but without presuming to offer an opinion, I would suggest that such a specimen as I have described would tend to bear out their opinions.—*Stephen Clogg; Looe, December 9, 1873.*

Food of the Salmon.—Is it not said that the salmon feeds upon other fishes, as herrings, &c., when in salt water? but when in our rivers has it the same depraved appetite? I have sometimes seen these noble fishes

"scouring" in the gravel of the Avon during the winter preparatory to depositing their ova; and as the year advanced I have seen numbers of the pretty little fry, and it has often struck me that if the parent fishes live upon other members of the finny tribes during their sojourn in fresh water, their depredations must be considerable. Insect fare is, I imagine, a portion at least of their means of sustenance when in fresh water, when such food is obtainable; and certain it is that the angler takes advantage of this weakness, and often deceives the unwary fish by his adaptation of silk, feathers, &c., in the formation of an artificial fly, if the success attending the use of the "Christchurch charmer" in the Avon is to be taken as an example.—*G. B. Corbin.*

Proceedings of the Entomological Society.

November 17, 1873.—Prof. WESTWOOD, M.A., F.L.S., President, in the chair.

This being the first Meeting of the Session, the President adverted to the recent vote of the Council of the Linnean Society, by which they kindly granted the use of their meeting-room to the Members of this Society during the present Session. It was resolved that the thanks of the Members be conveyed to the Council of the Linnean Society.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—‘The Transactions of the Linnean Society of London,’ vol. xxviii. pt. 3; vol. xxix. pt. 2; Proceedings, Session 1872—73; presented by the Society. ‘Mémoires de la Société de Physique et d’Histoire Naturelle de Genève,’ t. xxii. and xxiii. pt. 1; by the Society. ‘Annales de la Société Linnéenne de Lyon, Année 1872;’ by the Society. ‘Annali del Museo civico di Storia naturale di Genova publicati per cura di Giacomo Doria,’ tome i.—iii.; by the Museum. ‘Proceedings of the Royal Society,’ nos. 145 and 146; by the Society. ‘Bullettino della Società Entomologica Italiana,’ t. v. trim. 2 and 3; by the Society. ‘Bulletin de la Société Impériale des Naturalistes de Moscou, Année 1873,’ No. 1; by the Society. ‘The Journal of the Quekett Microscopical Club,’ No. 24; by the Club. ‘Coleopterologische Hefte,’ pt. xi.; by the Editor, Baron E. v. Harold. ‘Cistula Entomologica,’ pars vii.; by E. W. Janson. ‘The Canadian Entomologist,’ vol. v. nos. 6—9; by the Editor. ‘The Entomologist’s Monthly Magazine’ for August—November; by the Editors. ‘The Zoologist’ and ‘Newman’s Entomologist’ for August—November; by the Editor. ‘L’Abeille, 1873,’ livr. 7—11; by the Editor. ‘Iconographie et Description de Chenilles et Lépidoptères inédits,’ par P. Millière, tome iii.

livr. 30—33; by J. W. Dunning, Esq. 'Remarks on Synonyms of European Spiders,' No. 4; by the Author, T. Thorell. 'Lepidoptera Exotica, or Descriptions and Illustrations of Exotic Lepidoptera,' by Arthur Gardiner Butler, F.L.S., &c., pt. xviii.; by E. W. Janson. 'Exotic Butterflies,' part 88. 'The Transactions of the Entomological Society of New South Wales,' vol. ii. pt. 5; by the Society. 'Stettiner Entomologische Zeitung,' vol. xxxiv. nos. 7—9; by the Entomological Society of Stettin. 'The Natural History of the Tineina,' vol. xiii.; by the Author, H. T. Stainton, Esq. 'Mémoire sur les Cléonides;' 'Description de quelques espèces nouvelles de Coléoptères de Syrie;' by the Author, M. A. Chevrolat. 'L'Attacus Atlas le Géant des Papillons, son Introduction en France, par M. A. Braine; son Histoire et son Habitat, par M. Maurice Girard;' 'Etudes sur les Insectes Carnassiers utiles à introduire dans les Jardins et à Protéger contre la Destruction,' par M. Maurice Girard; by M. Girard. 'Ueber Parthenogenesis der Artemia salina;' by the Author, C. v. Siebold. 'Contributions to Entomological Bibliography up to 1862,' no. 2; by the Author, Albert Müller, Esq. 'Troisièmes Additions au Synopsis des Gomphines;' 'Troisièmes Additions au Synopsis des Caloptérygines;' by the Author, M. E. de Selys-Longchamps. 'A Catalogue of the Neuropterous Insects of New Zealand, with Notes and Descriptions of New Forms;' by the Author, R. M. Lachlan, Esq. 'The Ancestry of Insects: Chapter XIII. of "Our Common Insects;"' by the Author, A. S. Packard, jun. 'The Gall Midge of the Yew (*Cecidomyia Taxi*, Inchbald);' 'Apion apricans, *Herbst*, a Weevil injurious in the Kitchen Garden;' 'Review of the Take-all (the Corn Disease of Australia), scientifically considered, by Dr. Carl Mücke: Prize Essay, published under the authority of the Board of Agriculture of Victoria, Melbourne, 1870;' by the Author, Albert Müller, Esq. 'On the Amount of Substance-waste undergone by Insects in the Pupal State; with Remarks on *Papilio Ajax*,' by Raphael Meldola, F.C.S.; by the Author. 'Synopsis of the Histeridæ of the United States;' 'Revision of the Genera of the Tribe Hydrobiini;' 'Revision of the Species of several Genera of Meloidæ of the United States;' by the Author, George H. Horn, M.D. 'Descriptions of North American Noctuidæ,' no. 3, by Aug. R. Grote; by the Author. 'A Contribution towards a Monograph of the Indian Passalidæ,' by Dr. F. Stoliczka: by the Author. 'On *Rhopalorhynchus Kröyeri*, a new Genus and Species of Pycnogonida;' 'Note on certain Species of Phasmidæ hitherto referred to the Genus *Bacillus*;' by the Author, James Wood Mason, Esq. 'Mittheilungen der Schweizerischen Entomologischen Gesellschaft,' vol. iv. nos. 1 and 2; by the Society.

By purchase:—'Hymenoptera Scandinaviæ,' auctore C. G. Thomson, tom. ii. 'Bericht ueber die wissenschaftlichen Leishingen im Gebiete der Entomologie wähund des Jahres 1870, von Friedrich Brauer, und wähund

der Jahre 1869 und 1870, von Dr. A. Gerstaecker.' 'Die Cetoniden der Philippinischen Inseln,' Beschrieben von Dr. Otto Mohnike.

Election of Member.

Mr. C. W. Dale, of Glanville's Wootton, Dorsetshire, was balloted for and elected a Member of the Society.

Exhibitions, &c.

Mr. Higgins exhibited two bred specimens of *Deilephila Euphorbiæ* (one a remarkable variety), and a *Sphinx Pinastri*, taken near Harwich in June, 1872, when several specimens of the former were found in the larva state.

Mr. Champion exhibited a bred specimen of *Pachnobia alpina* from Braemar; also *Harpalus quadripunctatus*, *Dej.*, from Braemar; *Anisotoma macropus*, *Rye*, from Claremont; *A. pallens*, *Germ.*, from Deal; *Liosomus troglodytes*, *Rye*, from Faversham; and *L. oblongulus*, *Boh.*, from Caterham.

Mr. W. C. Boyd exhibited living larvæ of *Brachycentrus subnubilus*, which had been reared from the eggs. They fed upon *Confervæ*, and the cases constructed by them were clearly quadrangular (though the angles were not prominent), and very diaphanous, so that the movements of the larvæ could be discerned within.

Mr. Bond exhibited five specimens of *Chilo gigantellus* from Horning Fen.

Mr. Vaughan exhibited *Pempelia Davisella* reared from larvæ, feeding in a web, upon shoots of *Ulex*.

Mr. Stevens exhibited *Leucania L-album* and *Cerastes erythrocephala*, said to have been taken at Canterbury by Mr. G. Parry. Also *Acontia solaris* taken near Dover in 1872, and a curious variety of *Arge Galathea* taken in 1871 on the South coast.

Mr. Müller remarked that at a meeting of the Scientific Committee of the Royal Horticultural Society, on the 12th instant, Dr. Masters had exhibited some galls found at Wimbledon on the roots of *Deodara*. That gentleman had since submitted to him further specimens of this gall, which he had found to agree, in external and internal structure, with those of *Biorhiza aptera*, *Fab.*, usually occurring on roots of oak. Mr. Müller stated that he had since bred several specimens of *Biorhiza aptera* from these *Deodara* galls, and that he believed it to be the first instance where a true *Cynips* had been known to transfer its attacks from oak to a species of Conifer.

Papers read, &c.

Mr. W. H. Miskin, of Queensland, communicated some remarks on *Mynes Guerini*, described by Mr. A. R. Wallace in the 'Transactions of the Entomological Society,' 1869, p. 77, but which he considered to be identical with *Mynes Geoffroyi*, *Guer.*, from the Malayan islands. He alluded to a singular peculiarity in the economy of the insect, namely, that

the larvæ, which were gregarious in their habits, preserved their social instincts even to their assuming the pupa state—the chrysalides being found collected together in groups of three or four individuals, united at the tails.

A paper was read entitled “Notes on the Habits of *Papilio Merope*, with a Description of its Larva and Pupa,” by J. P. Mansel Weale, B.A.

Mr. Roland Trimen communicated some “Observations on *Papilio Merope*, *Auct.*, with an Account of the various known Forms of that Butterfly.”

Mr. E. W. Janson announced the approaching visit to this country of Dr. G. H. Horn, the well-known Coleopterist from Philadelphia.

December 1, 1873.—H. T. STAINTON, F.R.S., &c., Vice-President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—‘*Berliner Entomologische Zeitschrift*,’ 1873, 1—2; presented by the Society. ‘*Beitrag zur Lepidopteren-Fauna Transkaukasiens und Beschreibung Zwei neuer Arten*,’ by the Author, Gustav von Emich. ‘*The Object and Method of Zoological Nomenclature*,’ by the Author, David Sharp, M.B. ‘*Contributions to Entomological Bibliography up to 1862*,’ No. 3; ‘*Review of the “Fifth Annual Report on the Noxious, Beneficial and other Insects of the State of Missouri, made to the State Board of Agriculture, pursuant to an Appropriation for this purpose from the Legislature of the State,”* by Charles V. Riley, State Entomologist, Jefferson City, 1873;’ by the Author, Albert Müller. ‘*The Entomologist’s Monthly Magazine*’ for December; by the Editors. ‘*Newman’s Entomologist*’ and ‘*The Zoologist*’ for December; by the Editor. ‘*Stettiner Entomologische Zeitung*, 1873,’ Nos. 10—12; by the Society.

By purchase:—‘*Beschreibungen europäischer Dipteren*,’ Band iii.

Election of Member, &c.

Mr. Frederick Newell Arber, of Islip, Northamptonshire, was balloted for and elected a Member of the Society.

Mr. John George Marsh, of 842, Old Kent-road, was balloted for and elected a Subscriber to the Society.

Exhibitions, &c.

Mr. Bond exhibited a hybrid specimen between *Clostera curtula* and *C. reclusa*, partaking of the characters of both parents.

Mr. Jenner Weir exhibited specimens of a minute Hymenopterous insect (a species of *Psen*), which he had observed in large numbers (probably 150) in June last, on a pear-leaf at Lewes. They had congregated together on the surface of the leaf like a swarm of bees, though it was not apparent what motive brought them together.

Mr. Dunning read some portions of a letter which he had received from Mr. Nottidge, enclosing the Eighth Report of the Canterbury (New Zealand) Acclimatization Society, and stating that the red clover had been introduced into the colony, but that they had no humble bees to fertilize the plant. Also that certain Lepidopterous insects had been accidentally imported into the islands, but that the corresponding ichneumons were wanted to keep down their numbers. He would be glad of any suggestions as to the best mode of introducing both humble bees and ichneumons into the colony, as might be requisite. It was suggested that by procuring a sufficient number of humble bees in a dormant condition and keeping them in this state (by means of ice) during the voyage the result might be attained. Mr. McLachlan mentioned that he had received a letter from Capt. Hutton from the same colony, stating that indigenous Aphides did not, apparently, exist there, but imported species were becoming very destructive, and he asked if it would be possible to introduce *Chrysopa*.

Papers read, &c.

Mr. Baly communicated a paper on the Phytophagous Coleoptera of Japan, being a continuation of that contained in the 'Transactions' of the Society for 1873, p. 69.

Mr. Bates contributed a paper on the Longicorn beetles recently brought home by Mr. Thomas Belt from Chontales, Nicaragua, being supplementary to that published in the 'Transactions of the Entomological Society' for 1872, p. 163. The additional species amounted to thirty-seven, which, with those enumerated in the previous paper, brought up the total number to 309. Mr. Bates remarked that a work by Mr. Belt would shortly be published on Nicaragua, which he believed would be of much interest to entomologists.

Mr. W. H. Miskin, of Queensland, communicated criticisms on a Catalogue of the described species of Diurnal Lepidoptera of Australia, by Mr. George Masters, of the Sydney Museum.

A fourth portion of the 'Catalogue of British Insects,' now being published by the Society, was on the table. It contained the Hymenoptera (*Oxyura*), compiled by the Rev. T. A. Marshall, M.A.

A Prospectus was on the table of a Scientific Societies Club, which it was proposed to establish in the neighbourhood of Burlington House.—*F. G.*

On the Occurrence of Limulus Polyphemus off the Coast of Holland, and on the Transmission of Aquarium Animals.*
By W. A. LLOYD.

IN the summer of 1860 a large number of this creature, *Limulus Polyphemus*,—the horse-shoe crab, or, as it is called in Germany, the arrow-tailed crab,—was hawked about, in a living state, on a barrow, in the streets of Hamburg, just as I have similarly seen living land-tortoises offered for sale in the streets of London. These crabs have the term “horse-shoe” applied to them because the anterior portion (when the posterior part is bent away from it) much resembles in general form the toe part of a horse’s hoof, and “arrow-tail” because the long posterior spine is said to be used by the natives of the countries where it is found for the points of arrows and spears; the point of it precisely represents in its unsymmetrical curve the curve of our modern bayonet of warfare. They are also termed “king crabs,” but I do not know why. Their position in the scale of nature is not yet precisely determined. These crabs so seen in Hamburg were obtained from North America by Mr. Hagenbeck, the well-known German dealer in wild beasts and other natural-history objects. They were purchased by many persons, and some were placed in a small marine aquarium in the Hamburg City Museum; others were kept by Dr. Meyer and Professor Möbius in some tanks I had made for them, as at that time I was a dealer in aquaria in London. The interest excited by these crabs and these small aquaria, joined to the interest caused by the aquarium I had recently made in the Acclimatation Gardens in Paris, which was very popular as the greatest and best aquarium then in existence, much advanced the idea of having an aquarium in the Zoological Gardens of Hamburg, then in the commencement of their formation, and all these things together led to my being engaged for aquarium work in Hamburg in the summer of 1862. Naturally enough, there existed a desire, from association, to possess some of these crabs in the Hamburg Aquarium when it was opened, and some arrived in 1865, and lived very well, and were alive when I left Hamburg to return to England in 1870. They all came from New York or its neighbourhood, and the success with which they were brought over led to my getting

* See ‘Zoologist,’ S. S. 3740, and ‘Entomologist,’ vi. 529 (with figures).

many more than the Hamburg Aquarium could accommodate, and I was told to put our surplus number in spirits. To me, however, it seems such a horribly cruel thing to plunge into alcohol creatures in the full vigour of life, and it is moreover shockingly inhospitable to do so to foreign animals after they have been brought from their own far-distant countries. So I wrote to aquarium people everywhere, and succeeded in selling or in giving away all we had to spare; and then I issued circulars, printed in English, French and German, begging that no more be imported till further orders. My circular came out too late, however, for on the very next Sunday morning I was asked to call at the house of a captain of a Hamburg and New York steamer to see a lot of these crabs, and I was astonished at beholding a great number, in his garden, walking about and looking like great dully-polished light brown dish-covers marching about by the agency of invisible legs, they being concealed by the shield-like carapace, each with a stiff tail trailing behind it. The sight would have been comical had I not been troubled with the remembrance of the dreadful alcohol, for I was bidden to take charge of the whole lot, for various museums; and I accordingly conveyed them to our Gardens in a four-wheel cab, they filling it as high as the base of the windows, and I, seated outside, was sorely troubled with my charge; but that night I defiantly resolved what to do. I arranged to secretly keep them alive by sprinkling them with water in a cool place till the following Thursday, when the steamer left for London, and this vessel, and two other steamers, had on board (by the kindness of Pearson and Langnese, the owners) free accommodation for natural-history purposes, and, among other things, a one-hundred-gallon cask of sea-water placed on end, with a loose cover on it. On Thursday afternoon, therefore, I drove to the harbour with a cabfull of crabs, emptied the water out of the cask, filled it with the crabs, put on the cover to keep them moist, and saw the steamer off, having previously told a trustworthy and kind man to throw the crabs overboard into the sea when the steamer got fairly into salt-water a little on the British side of the island of Heligoland. This was faithfully done, and I had evidence of it duly furnished to me. It occurred in August, 1866, and I can have no reasonable doubt (in the absence of any evidence showing that others have been since placed in the seas of Northern Europe) but that those which recently were caught on the coast of Holland were either those I thus introduced or their descendants. I may as

well confess that in addition to whatever humane feelings I had in thus saving these animals' lives, and also in seeing whether they would breed under the circumstances stated, there was in the act a little of a spirit of mischief, to see whether British naturalists would squabble at the appearance of living animals so essentially non-European if they turned up in England, and whether, if so, and by what rule, they would be admitted to the British Fauna; and I am rather disappointed at finding there has been no more "fending and proving" than there has been over the matter.

It is interesting to go into the reason why these and some other lungless aquatic animals are brought from great distances alive and well, and with ease, while so many other lowly-organized lungless water animals are transported with such great difficulty. We apply the term "hardy" to such crabs as *Limulus*; to the Old and New World land-crab (*Gecarcinus*); to the West Indian land hermit-crab (*Cenobita*); to *Sesarma*, a crab (allied to our English *Gono-plax*) from the Navigator Islands; to our British shore-crab (*Car-cinus*); and to some others, but I name only these five as being those with which I am acquainted in a living state; and by "hardy" we undefinedly mean that these animals are constructed to live for long periods when they are not actually immersed in water, but where they can obtain enough water to keep their gills moist enough for the sufficient aëration of the blood coursing through their gill-filaments; and in accordance with this arrangement all of these five are eminently shore animals.

We are now beginning to learn that, up to a certain point, the value of water for non-lung-breathing aquatic animals does not so much depend on its *amount* as upon its *distribution* in such manner that it shall absorb the greatest quantity of atmospheric air, or rather of the oxygen which enters into the composition of that air, leaving much of the nitrogen out, unabsorbed. The earliest observer known to me of this fact was the late Dr. R. Ball, who, in Bell's 'British Crustacea' (8vo, 1851), records how much better he kept a crayfish (*Astacus*) in a shallow vessel than in a deep one. In all my aquarium work I keep this law in view, and I regulate the amount of surface of water exposed to air, as well as the actual quantity of water, according to the known requirements of the animals to be kept; and the result is very surprising both on the health of the creatures, and in the saving of the money cost of constructing and maintaining aquaria. I also

apply the rule to the *conveyance* of aquarium animals. To give an actual example, I find that the following animals, and some others, may, at certain temperatures, be safely sent from Southend, in Essex, to the Crystal Palace in boxes (or preferably in baskets) packed in damp freshly-gathered sea-weeds :—

1. Nearly all the Sea-Anemones.
2. Most of the Echinodermata.
3. A large number of Annelids.
4. Many Crustacea.
5. Some of the Tunicata.
6. Nearly all shelled Mollusca, both univalves and bivalves, and some of the Nudibranchiata.
7. The following fishes :—Amphioxus (this once came alive from Naples in a post-letter, and four of them so brought are still alive in the Crystal Palace Aquarium), plaice, soles, brill, rocklings, eels, gobies, blennies (of three species), sea-scorpions.

The explanation of the reason *why* they so travel is this : they are surrounded with moisture in a sufficient degree to keep their bodies, in the case of sea anemones, and especially in the case of the specialized breathing apparatus in the other animals, to enable respiration to be carried on. Take, for example, any fish so conveyed. It is not immersed in water, but its gills are kept wet by such very thin films of water that their thinness, otherwise shallowness, enables them to be instantly oxygenated by contact with the atmospheric air, which enters the apertures of the containing box or basket, and which permeates the entire mass, and therefore the gill-filaments are kept wet and separate from one another, and the blood uninterruptedly flows through them and is aerated as it does so, oxygen being absorbed from the perfectly aerated water, which thus does double duty, in a measure. I admit that the balance thus maintained is a delicate one, and is easily disturbed by external causes. Thus a heated atmosphere would cause the moisture to evaporate and the gills to dry up, and the circulation of the blood would be arrested, and the fish or other creature would soon die. So also great cold would freeze the gills into a temporarily dry mass, and death would likewise ensue. It will be observed that many of the creatures I have enumerated never voluntarily leave the water, either in the sea or in aquaria, while others do go out of the water of their own accord, in tanks and in the ocean. But there is one thing which I do not yet understand, and which I should be very grateful to

have explained. It is this, that while many of the creatures I have named will bear the four hours' journey from Southend, some of them will not bear the twelve hours' transit from Plymouth, though equal care be apparently taken with the packing in both cases.* But when such packing is possible, the gain is enormous in everything. We often, at the Palace, get a couple of thousand of animals, or more, in packages weighing altogether not half a hundred-weight, while if the same animals needed to be conveyed in properly aerated masses of actual water, each creature would require a pound-weight of water, instead of only a fraction of a grain-weight to each. The money value of the moist plan is strikingly shown in the instance of shrimps, of which we use about a ton weight every year in the Crystal Palace Aquarium for feeding purposes, and we require them alive, because many animals refuse to eat them when dead (when, too, they rapidly decompose and become poisonous), and besides, we are obliged to

* Mr. Herbert Ingall, for whose opinions on all matters I have the highest respect, gives the probably right explanation:—

“In packing animals for travelling in a moistened substance, but to which the air has free access, we would certainly seem to be employing the most effective as well as the most convenient method of sustaining the life of the animals so treated, as the moisture keeps the tissues moist (to a certain extent) in the natural form, so as not to stop the circulation or other vital processes of the living things; the moisture facilitating the respiration by being in thin films, and therefore the more easily they absorb oxygen. In practice this manner of carriage is found to be successful in some cases for very long periods of time, and the question naturally arises,—If an animal so treated can live for four or twenty-four hours, why should the same method not be effective and successful for periods of forty or two hundred and forty hours? To answer this we can but suggest the reasons of the method being unsuccessful for the longer periods, and these suggestions be proved by experiment, as there are no doubt many causes acting together that result in the death of the animal. Let us consider what may be the causes. Least of all we may consider the (in the larger and more active animals at least) undesirable and cramped position that they must necessarily suffer from, and their inability to take food. But the most probable cause of death is this—that the quantity of air and oxygen supplied to the animal being often more than usual, the respiration and vital processes are more rapid, and the waste necessarily greater, as also therefore will be the excretions of the animal. When (and this period will of course vary according to circumstances) the excreta, not being removed, as they would be in the sea, become so great that the oxygen is all required to decompose the organic poisons (for such they are) the animal naturally dies of asphyxia, there being no oxygen available for the respiratory processes, or it may even die of organic poisoning. It is I think *probable* that this is the main cause of death after certain varying periods. Cold would of course retard it by lessening the rapidity of the vital processes. It perhaps might be proved *experimentally* by packing animals in the way described, and causing the removal of the *effete* matter in some way.”

keep them in a living state till they are eaten from day to day. They are accordingly brought in baskets measuring eighteen inches long, twelve inches broad, and only two inches deep, and this small thickness enables the shrimps to be well aerated throughout on the journey. I devised this plan, as when they came in high baskets only those at the surface arrived alive. They cost us, in good condition, about a shilling a quart, but if it was necessary to bring them alive, *in water*, they would cost at least a guinea a quart! This system of exposing water to air in a state of exceedingly minute division may be seen in the Crystal Palace Aquarium in a kind of inverse application of the principle, the air as it descends being very finely pulverized in every tank, and all that the water can possibly absorb is taken up. It could not be so finely comminuted and diffused if it were made to ascend, and therefore the ascending plan is a very wasteful one.

To return to *Limulus*. They are brought from America in tubs or boxes containing a layer, two or three inches deep, of wet sand, which is kept moist by having water—sea or fresh water—thrown on it occasionally. Some travelled from New York to Liverpool in a deal-box kept moist by a bladder of water suspended inside it, and in this they again travelled from Liverpool to Hamburg. Some I by accident kept in some badly aerated sea-water in a vessel with steep sides, out of which the crabs could not climb for air. I removed them, apparently dead, and sent them to the City of Hamburg Museum to be put in spirits, but they revived on a cold damp stone-floor, where their gills became oxygenated, and were brought back to the aquarium, where they lived long.

At Professor Owen's request, I sent him some notes on the habits of *Limulus* in captivity, and he has printed my observations with his own in the Linnean 'Transactions' (vol. xxviii. pp. 471—472), thus:—

“The ulterior pair of limbs are not for walking, but exclusively for burrowing. These limbs are terminated by four long stiff lobes of an oval or leaf shape, jointed at the base, on the leg, and capable of being opened and closed in a four-radiate manner. When it wishes to burrow, these two limbs are, sometimes alternately and sometimes simultaneously, thrust backwards below the carapace, quite beyond the hinder edge of the shell; and in the act of thrusting, the lobes or plates on each leg encounter the sand, the resistance or pressure of which causes them to open and fill with

the sand, a load of which at every thrusting operation is pushed away from under the crab, and deposited outside the carapace. The four plates then close, and are withdrawn closed, previously to being opened and charged with another load of sand; and at the deposit of every load the whole animal sinks deeper into its bed, till it is hidden all except the eyes. The great hiding shield of a carapace again prevents one from seeing whether this excavating work is aided by the fanning motion of the abdominal false feet, as is the case with the British lobster; but I *think* there is such fanning, as I have seen signs of sand being driven through the sand-orifices as if urged by a current of water.

“The tail-spine of *Limulus* is used in locomotion in the following manner:—The animal having climbed up a rock in the aquarium till it has got near to the top of a tank (which in Hamburg contained thirty inches of water in depth perpendicularly), and having assumed a vertical position, leaves go its hold on the rock, and allows itself to fall backwards; but its downfall is instantly checked, and the creature propelled upwards by a downward flap of all the strong overlapping false feet; and when the impetus given by them has ceased, the animal sinks down, but is prevented from falling prone on the floor of the tank by alighting on the tip of the perpendicularly hanging-down spine. The moment that is done, and before the creature has lost its balance on the spine, the false feet make another flap, and give another impulse upwards and forwards; and so it progresses by a combination of swimming and hopping, or by a succession of slow hops on one leg, as it were; and all this time the position of the carapace is slanting, the top of the carapace inclining downwards at an angle of about 45° , the second segment of the body being at another inclination, and the tail-spine hanging freely vertically, as before mentioned; and by being brought down by its joint at various deviations from the upright one, the spine changes the direction of the march, while the false (swimming) feet effect the actual propulsion. The *Limulus* was fond of thus going about at night (generally remaining in the sand all day). Another use was made of the tail-spine, as a lever by means of which it righted itself when it fell off a rock on its back. The spine is then bent; *i. e.* its point is planted in the sand, so that it makes an acute angle with the carapace, which is then so far raised that some of the feet are enabled to grasp a projecting surface, either longitudinal or vertical, or at some combination of the two; and the crab then turns over.”

Limulus has often caused me to be undeservedly blamed, because they so constantly hid themselves in sand by day in the perfectly aerated water of the Hamburg and Crystal Palace aquaria, while in the imperfectly aerated water of the aquaria of Hanover and Berlin they climbed about the rocks all day, at their surface, and of

course in sight of visitors, because they were seeking for air. So many unthinking people ascribed my inefficient exhibition of these animals to my want of skill, forgetting how many other animals died from the badly aerated water in the places I have named.

Sesarma was brought alive from the Navigator Islands to Hamburg in a slow sailing-ship. It is, as I have already named, a relative of our British crab *Gonoplax*, which never walks out of water. At first the captain of the vessel put some of his captives in a vessel of water out of which they could not crawl, and the water being but imperfectly aerated, the crabs soon died. So he arranged a box with moist earth and sand, and in this the remaining specimens burrowed, and came out occasionally, and did well. I noticed, without being told by persons or books, that the surface of the pterygostamian regions of the living *Sesarma* I had in Germany was reticulated, or granulated, by being divided into numerous small regular squares, and that these retained much water by mechanical entanglement. On my telling my friend Dr. F. Hilgendorf, then of Hamburg and now of Yokohama, that I suspected that this arrangement was to enable the crabs to carry about with them their own aquaria of perfectly aerated (because shallow) water, he said it was so, and that some sharp German biologist, whose name I forget, had made the discovery before I did.

Cenobita Diogenes is a powerful West Indian land hermit-crab, living in a univalve shell like our British hermits, but spending much of its time out of water, entering it, I believe, only for depositing its eggs. Yet it is, of course, a gill-breathing animal, needing water to moisten its gills, and so enabling its blood to be purified. How very small the quantity of water it needs may, however, be judged when I say that the first living example I saw was given me by a Swedish carpenter, who brought it from Stockholm in his jacket-pocket, where he had kept it for some weeks previously as a pet. The next I saw was a lot of twenty brought from the mouth of the river Gibarra, in Cuba, to Hamburg in a sailing-vessel. They were found walking about in the burning sun on sand which was all the hotter because black. I went on board to fetch them, and found them in an old cigar-box, which was wrapped in a sailor's "Guernsey" to keep it warm in the hot cooking-place or caboose. Some of the sailors said the crabs fed on tobacco, and others that they ate potato-peel, so both of these substances were placed in the box, on opening which the stench

proceeding from it was awful. But the crabs were alive and well. On opening the window of the cab on my way to the Zoological Gardens, I let in some air, and, the day being very cold, the crabs soon became torpid, and, losing hold of their shells, gradually fell out of them as if dead, and I was in great trouble. I, however, put them in a tray before the fire of the aquarium steam engine, and they soon revived, and, walking about, repossessed themselves of their shells. I afterwards kept them upon damp hot sand, at a temperature of 95° F., and fed them on meat for several months. They would never stop long in the aquarium tanks, but crept out and walked on the floor among visitors.*

Gegarcinus was kept several times in the Regent's Park Zoological Gardens long before there was an aquarium there. The most important thing yet done in this way of comparatively dry transmission was the sending of trout-eggs from Britain to Australia, and there hatching them in such a successful manner that large trout are now found at the antipodes. The eggs were packed in perforated chip-boxes lined with moist moss, and thus the ova had both air and water (a little, but enough, of both) circulating in the interspaces left by the round eggs. In addition, they were kept cold by ice, and the low temperature thus retarded the hatching on the voyage by diminishing the rapidity of respiration, and thereby much lessened the demand for oxygen.

We all know how medicinal leeches—which are, of course, gill-breathing animals—are sent from country to country packed in moist earth, and that enclosed in bags, with no great percentage of death. Also how eels, periwinkles, mussels, cockles and oysters are transported nearly dry, yet alive and well. Oysters and clams even come to Britain alive from America. Sea-anemones and many other aquatic creatures, including small carp and tench, are frequently sent by post, in moist packing, alive. If these animals had to be transported in water, the weight and trouble would be so great that a trade in them could never be remunerative. What I want, therefore, is to more generally and economically apply to Natural History what has been done for commerce.

* At about the same period there were some Cenobita in the London Zoological Gardens, and I wrote there to know what food I should give mine, and the perfectly serious reply was, "*Oatmeal boiled into hard dumplings!*"

I have written this paper in the hope that it may do good practical service in obtaining for our Crystal Palace Aquarium many marine animals from the splendid aquarium now being constructed, with my help, at Naples; and I trust that Dr. Anton Dohrn, its owner, will soon send us many more animals (in the moist way), in addition to those which—aided by the kindness of shipowners, captains and crews—we have already received from him in water. Dr. Dohrn might re-commence with Mediterranean sea-anemones and crabs, as I believe many of them will survive the overland journey by using care and avoiding large packages. Several packages made up into one is the right plan; and for anemones and some other animals, baskets like our shrimp-baskets, tied six in one, would do very well, I think.

Ospromenus is an oriental fish (Indian, I believe), of which more than one has been brought alive to, and kept at, the Regent's Park Zoological Gardens. I do not know the circumstances of its transmission, nor anything of its habits in England; but, as it belongs to the same family as the "climbing perch" (*Anabas scandens*), I think that, most likely, like the latter fish, its anatomy permits its occasionally living for considerable periods when not actually immersed in water, and of thus being easily sent to long distances. *Anabas* is provided with an arrangement enabling it to retain a quantity of water for the use of its gills when it is on dry land.

There is another creature (Protopterus or Lepidosiren) which, if a fish, is very closely allied to reptiles, but which in an aquarium is fish-like in its habit of remaining always below the surface of water, and which, if it had to be brought from its home in Africa immersed in a bulk of water, its transport would be so difficult that we should never see it alive in England. But it has been brought in a living state to Britain and to Germany, several times, because in its native haunts it lives in ponds liable to be dried by the sun, and then the creature rolls itself up into a compact ball of mud (hence it is called the "mud-fish"), which becomes hard and dry, yet containing the very small quantity of moisture and oxygen necessary for the animal's almost suspended animation and exceedingly slow breathing, and in this way, the means of oxygenating its gills being readily conveyed about with it, the animal can be sent from one continent to another, easily. On obtaining it, I have gently

broken away the indurated clay or mud and let the contained Protopterus drop into water at a temperature of about 70° F., when it has at once began to swim about as if nothing had happened. But having thus assumed so far the condition of a fish, and having no necessity to again enter a clay prison, it would be exceedingly difficult (I think) to send it back to Africa in water, as its conditions of existence have become quite changed. It would take far too great a space to narrate the instances of my having sent animals of various kinds, marine and fresh-water, of many of the hardy kinds, to various parts of the world, overland and by sea, and of my having received many from similar places; but now, having so good a correspondent as Dr. Dohrn, I hope he will send us many more, he being a good packer.

I find it hard to conclude, however, without telling of one little aquarium brought from Curacoa, in the most perfect manner possible. It consisted of a quart glass jar, its height being twice its breadth. It was half full of sea-water, unchanged during its transit to Hamburg, and six specimens of the mollusk *Trochus* arrived there in perfect condition, and were kept in the same jar of unchanged water for two years. On the voyage they climbed up the side of the jar, and there had the wash of the water, and they fed on the Algæ which grew quasi-spontaneously. But when large animals *must* be sent long distances in water, as, *e.g.*, *Lithodes arctica* from Hammerfest, in Norway, to the Crystal Palace, the trouble and cost are enormous, implying for a dozen of these crabs two casks each containing one hundred and twenty gallons of sea-water, with many changes on the voyage and careful supervision all along. If they could be sent in the moist way, their expense would be less than a tenth of what it now is.

In lately reading some observations by Milne-Edwards and Audouin on crabs, I notice that in almost every instance they give accounts of habits only of species which live much out of water and do not need an aquarium for their maintenance.

But about these horse-shoe crabs which I caused to be thrown into the sea, how can I help writing, "Cast thy crabs upon the waters; for thou shalt find them after many days."

W. A. LLOYD.

Crystal Palace, January 5, 1874.

Ornithological Notes from North Lincolnshire.

By JOHN CORDEAUX, Esq.

(Continued from S. S. 3782).

NOVEMBER AND DECEMBER, 1873.

Common and Jack Snipe.—November 2nd. Many both common and jack snipe arrived in the marshes about this date. Wind E.N.E.

Tree Sparrow.—This has been a most abundant species throughout the autumn. I see flocks, often containing several hundreds, almost each day, both amongst the hedges of the enclosed portions of the parish, as well as on the stubbles in the open marshes. They feed on scattered grain and various small seeds. Many I notice come to roost in the evening into the plantations, particularly those containing spruce. They do not resort much to the neighbourhood of houses or buildings, keeping, as a rule, to the open fields, woods and hedges. We sometimes, however, take an odd bird or two along with the common species in the sparrow-net from the stack-sides and the ivy on the walls of the house.

Peregrine Falcon.—Nov. 14th. Almost every autumn and winter I come across the peregrine beating for prey in the marshes or along the coast. One this morning swooped at a curlew, singling it out from a flock of six or seven. The falcon missed his stoop and did not renew it, flying off in a straight line, without making any further attempt to molest the birds, they on their part setting up the most hideous "caterwauling" and outcry I have heard for some time.

Fieldfare.—Nov. 14th. There have been large arrivals of these northern thrushes during the past week, and many large flocks have gone inland from our marshes.

Redwing.—Nov. 14th. I have noticed during the last ten days larger and more numerous flocks of redwings in this parish than has been the case since the severe winter of 1860-61.

Knot.—Nov. 7 and 8. Immense flocks arrived on the muddy foreshores of the river, probably the main body on their southern autumn migration, as they only remained a few days, during which time they were excessively wild and wary. On the 2nd December, on the North Cotes coast, there was the largest assemblage of knots I have seen for many years. One flock alone, when on the wing, extended not less than six hundred yards, flying at first in tolerably

compact order in a narrow column, the size, shape and length of which, however, kept perpetually changing. As the tide rose and covered the sands and "fitties" the knots congregated by thousands on two small sand-banks, uncovered for some time after the rest of the shore was submerged, and the tide washed the foot of the embankment. With a powerful binocular I could perceive no space left uncovered by birds; the appearance was that of two dark islands or banks resting on the sea; and these before the flocks took flight grew darker and more crowded in appearance as their many-feathered tenants drew in from the circumference towards the centre. They rose at last gradually, towering upwards like a column of smoke, with the roar and flicker of many thousand wings, sweeping away in a long undulating dark cloud, over the gray sea, to seek some distant and yet uncovered sand-bank on shore. Abundant as the knot is at certain times on our Lincolnshire coast, it is almost impossible to get within shooting distance of their vast flocks without resorting to stratagem. A frequent, and occasionally successful, plan adopted by our gunners is to lie down dressed in yellow oilskin, in some slight cavity on the sands, and then to jump up suddenly and fire as a flock passes over. To follow them on foot is hopeless, the distances are so great, the coast stretching away for miles like a sandy desert, and then there is always the risk of getting surrounded by the flowing tide, a risk which even the most careful and experienced gunner is liable to if he allows himself to be carried away by the ardour of the chase.

Snow Bunting.—Nov. 17th. To-day, in a twenty-six acre stubble near the embankment, was a flock of four to five hundred snow buntings, mainly immature birds, the proportion of adults being about one in eight or ten. It was a beautifully bright, clear and sunny day, and a prettier sight could scarce be seen than the varied plumage and lively graceful gambols (for so I may express it) of these little creatures. The air was alive with their musical twitterings, as they flew round and round the field, sometimes sweeping close past me, chasing and toying together, dashing to and fro in the most erratic manner, with many a make-believe attempt at alighting, which only ended in a renewal of activity; they were evidently in a most joyous and happy mood. My setter was a great source of attraction; they swept downwards over the dog's head, almost brushing him with their wings, and then would burst forth such a chorus of mellow tinkling music as might signify either

anger or surprise. Snow buntings continued to arrive in large numbers up to the middle of November, at which time the unploughed stubbles swarmed with them, and they far outnumbered all our other small birds put together. On the 19th I estimated one flock alone to contain one thousand birds, and saw other assemblies during the day of nearly equal size. They are very fond of alighting on fields of newly-sown grain, and with this brown background are very conspicuous, as each bird invariably chooses the top of a clod as a perch. They *very rarely* perch on bushes,—indeed, this is most exceptional,—and I can only recall two instances where it has fallen under my observation, and these only by individual birds and not by flocks. On the 10th of December, lying concealed behind a bank in one of the pastures, the better to pounce upon a trespassing gunner, some hundreds of snow buntings pitched close to me, and not a dozen yards away. Familiar as I am with these little birds, I was greatly struck with the very remarkable uniformity in their appearance. All had their heads in one direction, and although individuals differed in a lighter or darker shade of plumage, all had the colours disposed, or laid on, in three very distinct horizontal stripes, very plain and well defined, as if put on with a brush: they reminded me irresistibly of the coloured individuals in a Noah's Ark. This is not nearly so apparent when the bird is in hand, and a flock of living birds must be seen at close quarters to notice the peculiarity. The little snow bunting has always been a great favourite of mine: they are ever lively, even in the roughest and most ungenial weather; their cheery note and the flickerings of so many variegated wings go far to enliven and light up the otherwise dull and dreary landscape of the wintry marsh: they have come so far to visit us, and flown so long over stormy seas, from little known lands—bleak Tundras and wild treeless shores washed with the waves of arctic seas.

Golden Plover.—Nov. 22nd. Saw the first large flock of golden plovers, probably owing to the fine season and general dryness of the marshes, they have not visited us nearly in such numbers as is usually the case.

Heron.—December 2nd. I saw a group of thirteen herons this morning; they stood in various and picturesque attitudes on an elevated portion of the immense sandy level of this coast. The day was thick, hazy and warm, and the birds loomed as big as storks, appearing nearly twice their natural size. All objects seen

in such weather on the coast are always very deceptive: the same day I had a stalk after what appeared nothing less than a party of graylag geese, which on a nearer acquaintance were resolved into hooded crows.

Storm Petrel.—One day, about the end of the second week in December, there was a storm petrel flying to and fro in the outfall to the old dock at Grimsby.

Kingfisher.—Very abundant in the marshes since October.

Wood Pigeon.—Dec. 29th. One shot at roosting time had the crop crammed with haws.

JOHN CORDEAUX.

Great Cotes, Ulceby, Lincolnshire.

January 5, 1874.

Ornithological Notes from Norfolk. By H. STEVENSON, F.L.S.

(Continued from Zool. S. S. 3716.)

SEPTEMBER, 1873.

Wood Sandpiper.—Mr. J. E. Harting, when staying at Yarmouth, at the beginning of this month, shot a single bird of this species, on the 6th, from the banks of the Bure.

Green Sandpiper.—During the same week Mr. Harting also shot five green sandpipers from the marsh "dykes" about Breydon, these birds being then plentiful, as they were earlier in the season.

Waders on Breydon.—An accurate knowledge of species and the help of a good glass make long odds as between the amateur and professional gunner, and hence no doubt Mr. Harting's invariable success in picking up good birds on his visits to Yarmouth. Besides those above recorded, I find, from notes he has kindly supplied me with, that Mr. Harting procured an adult greenshank on the 4th; a young blacktailed godwit, from a marsh near Breydon, on the 5th, and no less than nineteen knots the same day; also two pigmy curlews out of a flock on the 12th. On the 16th he also found a solitary spotted redshank feeding on the "muds," which proved through the glass to have a partially black breast, but this rarity escaped owing to the punt having been too heavily weighted to be pushed within shot.

Gray Phalarope.—I am indebted to Mr. Harting for one of the most interesting specimens of this bird in my collection, from the intermediate state of its plumage, partly summer and winter. The date of its appearance, on the 12th of this month, is unusually early,

and that it was a chance straggler seems probable from its being quite alone, swimming about in a small "plash" of water on the Breydon "flats," and that no others have since come to my notice. As usual, it showed no apprehension of danger when approached. I have never seen an example of this species, killed in Norfolk, with so much of the summer plumage still remaining.

Terns.—One black tern was shot on Breydon by Mr. Harting on the 5th, and two on the 12th, with some of the common species.

Marsh Harrier.—Two of these birds were seen on Ranworth Broad during the first week of this month, and one was shot about a week later in that neighbourhood.

Osprey.—A young male killed on the 13th at Potter Heigham, near Yarmouth, was sent me on the following day, and was, I fear, the same bird which had been seen at Ranworth and one or two neighbouring localities during the previous week, carrying off fish from the broad waters.

Wigeon remaining in Summer?—A broadman at Surlingham, named Rich, assures me that when swan "upping" in the second week of August, at a place known as "Rudd's Waters," between Surlingham and Rockland Broads, he flushed a male wigeon, and having seen a pair in the same neighbourhood as late as the month of May, believes they remained to nest there, more particularly as the waters referred to are scarcely ever disturbed and have been full of other fowl throughout the summer. Rich assures me he saw the yellow about the head of the male wigeon distinctly. To these local gunners this species is known as the "smee," the difference between "smee" and "smew" being well known to them. Another broadman, named Trett, also from Surlingham, informs me that some forty years ago, when fishing in the summer, near the same "Rudd's Waters," a male wigeon came out from the reeds, quite close to the boat, when his father, who was with him, remarked that the female had a nest close by. Both these men assert that occasionally a wigeon or tufted duck, slightly wounded, remains with us through the summer.

Fieldfare.—Major Irby sent me, in the flesh, on the 20th, a fieldfare shot by himself on the 17th. This early arrival (?) shows no mark of immaturity, and from the breast-bone the birdstuffer who made a skin of it for me considered it a last year's bird. Mr. Irby also informs me that he saw two at Boyland about the 7th of June, but could find no nest.

Crane.—I am indebted to Mr. S. K. Gayford, of East Wretham, for the following particulars respecting a crane killed on a farm in his occupation on Mr. Birch's estate. The presence of some such bird in the neighbourhood was first indicated by the appearance of foot-marks on some arable land, quite a month before the bird itself was seen, and later still Mr. Gayford observed a very large bird "towering high in the air like a very big hawk." The mystery was solved, however, on the 30th of August, when a crane was seen by Mr. Gayford himself "about a hundred yards from a flock of sheep, and some two hundred yards from the shepherd's 'page' who was tending the sheep, feeding on a heath of about three hundred acres, with other large heaths and about two hundred acres of arable land adjoining." On that day Mr. Gayford spent several hours on horse-back trying to get within shot of it, but learning from the "page" that early in the morning it had been at the sheep-fold and paid little attention to him, he left his gun with the head shepherd, who shot the bird on the following Monday, the 1st of September. Mr. Newby, of Thetford, who stuffed it, informs me it was a male in immature plumage, and weighed ten pounds thirteen ounces. It is now preserved at Wretham Hall, with a white stork shot by Mr. Gayford near the same spot some thirty-five years ago.

Kingfisher.—Mr. Gurney sends me the following interesting note bearing on the migratory habits of this species:—"About the 13th of September several were observed on the beach at Blakeney, and on the 14th a single bird was seen flying by the edge of the waves at Cromer, which perched on a breakwater." Our birdstuffers have had several specimens during this month.

Waders.—A sanderling, two bartailed godwits and one knot were shot at Blakeney on the 23rd (also a young lesser tern), and a reeve at Beeston, near Cromer, on the 13th.

Great Crested Grebe.—Saw a pair on Surlingham Broad, with one young bird of the year, on the 24th.

Summer Migrants.—A few reed and sedge birds at Surlingham on the 24th; lots of sand martins and a pair or two of swallows, but no swifts. Several of the latter were seen at Beeston on the 9th; a male redstart at Erpingham on the 12th; several nightjars shot during the latter part of the month; a spotted flycatcher seen on the 3rd and a turtle dove on the 20th. On the 23rd Mr. Dowell informs me he saw swallows and wild geese flying over the same field.

OCTOBER, 1873.

Buff-coloured Swallows.—Two buff-coloured varieties of the swallow were killed at Surlingham in the early part of this month.

Norfolk Plover.—I am credibly informed that about the middle of this month a flock of about one hundred of these plovers was seen on land at West Harling, where they breed every year, and probably the resident birds had been joined by others. Mr. J. H. Gurney, jun., also saw some twenty of these birds rising in twos and threes from the turnips at Kelling, near Holt, on the 1st of September,—another breeding-haunt on the opposite side of the county.

Lapwing.—About the 18th Mr. Ringer tells me he saw a larger number of lapwings on his heath, at West Harling, than he has seen there for many years. This is probably, in some degree, the effect of the new Act.

Hooded Crow.—Mr. Gurney writes that the first flight of these birds was observed at Trimmingham, near Cromer, on the 9th, and a single bird at Sherringham on the 10th. On the 19th, a bright sunny morning, I saw a single hooded crow pass over my garden, close to Norwich, about 11 p.m., and afterwards, with a glass, watched a large number, all following the same route, in numbers of from six to a dozen, flying in a westerly direction. Sometimes a whole group would pause and hover round in circles, and then pass on like the rest, but most of them kept steadily on. We had much rain and wind on the following day.

Sea Gulls Inland.—On the 30th, about 3 p.m., I saw seven gulls, which were apparently the common gull (*Larus canus*), passing over the city at no considerable height, a circumstance I never remember to have witnessed before.

Great Gray Shrike.—One shot on Yarmouth Denes on the 27th.

Summer Migrants.—A female redstart seen by Mr. Gurney at Trimmingham on the 10th; nightjars heard near Northrepps on the 6th; Mr. Gurney saw a swallow on the 11th.

Wigeon.—Several on the coast at Beeston, near Cromer, and one shot from a pond in that parish on the 15th.

NOVEMBER, 1873.

Snow Bunting.—When staying at Lowestoft between the 10th and 23rd I found a large flock of these birds nearly every morning

on the Pakefield Cliffs, feeding on the stubble and ploughed lands. I imagine their appearance was regulated each day, in some degree, by the tide, as I found them later and later on the same spot, and if disturbed after a certain time in the morning they always flew off in the direction of the brackish marshes bordering the river. At other times when flushed they would fly round, uttering a pretty musical note on the wing, all twittering and turning together, and sometimes tamely alighting in the path within a few feet of the passers-by. There appeared to be over a hundred when I first saw them, but their numbers diminished by degrees, being probably shot at in the marshes: the sight of the whole flock as they alighted on a dark plough was very peculiar, the white on the wings being visible after the darker tints were lost in contact with the soil, and for an instant giving the appearance of strewn fragments of white paper, falling with the wind. They never alighted on the sands or sloping sides of the cliffs, but kept to the fields, notwithstanding the traffic.

Stonechat and Goldcrest.—I found several pairs of stonechats on the Lowestoft Denes, and on one occasion three or four pairs of goldcrests in some furze-bushes, on the summit of the cliffs.

Gulls.—Saw several fine old great blackbacks “riding” out at sea, near the fishing-smacks, and towards the time of low water I always remarked considerable numbers of gulls, chiefly young birds, making towards Yarmouth, sometimes fifty or sixty in a flock: these no doubt frequent the Breydon Muds daily, when exposed. All these birds seemed to be in full moult at the time, as the sands at high-water mark were strewn with their wing-feathers, from old as well as young. I noticed on one spot on the sand-hills, where a gull had evidently been preening itself early in the morning, as many body-feathers as a swan would leave after a similar toilet by the river-side.

Ruff.—A young male of this species was shot at Stalham on the 21st.

Kingfisher.—Many of these birds seen during the month, as at Aldeburgh, according to Mr. F. Hele’s note in the ‘Field’ of November 15.

Mealy Redpoll.—These birds, so scarce last winter, are now most plentiful. Our birdcatchers have taken many of them quite close to the city, where they frequent the alder trees near the river.

Hawfinch.—The Rev. H. T. Frere informs me that a flock of some fifty hawfinches appeared this month in the same garden at Diss where such numbers were shot last winter. The attraction is no doubt the yew-berries, as proved by dissection last year; but as no specimens have been received by our birdstuffers from any other localities, I am inclined to think these birds, in spite of persecution, are all reared in that neighbourhood. One or two pairs were known to have nested in that garden in the summer; they have also bred in several other parts of Norfolk this year.

Spotted Rail.—Three of these birds have been sent up to Norwich during this month.

Late House Martins.—Mr. Gurney saw a flock of from twenty to thirty flying round Cromer Church on the 3rd of November; and a few were observed also on the 4th and 5th. Not a single swallow seems to have been noticed at this time, but Mr. J. H. Gurney, jun., observed a sand martin on the river at Buckenham on the 23rd of November.

DECEMBER, 1873.

Stonechat.—Mr. Gurney remarked these birds near Cromer on the 6th and 11th of this month.

Glaucous Gull.—Two immature specimens have been sent to Norwich to be stuffed; one on the 5th from Lowestoft, and one from Yarmouth about the 16th.

Snow Bunting.—About a score of these birds were shot at Ludham, which frequented the reedy spots near the broad, a somewhat inland locality, but I have heard of one shot near this city, and others netted, of which I bought two pairs for my aviary.

Nuthatch.—On the 15th Mr. Gurney saw a pair of nuthatches attacking a lump of mutton-fat hung out for the tits, which they seemed greatly to relish. One was more orange on the under parts than the other, and always drove away the paler bird till it had finished its own repast. Mr. J. H. Gurney, jun., has also observed this species hiding nuts in the ground, as well as in the clefts of trees.

Garden Warbler?—Mr. Gurney sends me the following singular note from the remarks of a very careful observer, named Galley, at Northrepps, who is very well acquainted with our ordinary migrants, both winter and summer. On the 15th, when working in his garden, Galley's attention was drawn to a bird, which he took for a

garden warbler, bathing itself in the dew-water collected in the leaves of his cabbages. He watched it carefully whilst it performed this operation, first on one cabbage and then on another, during which time it frequently uttered a note which he compared to "sawing." When shown a collection of skins of warblers he selected a rather pale-coloured specimen of the garden warbler as the one he saw.

Blackbird.—A very unusual number of these birds at Keswick, near Norwich, at the present time, are charged with destroying a field of wheat by picking the grain out of the ground, but leaving it on the surface. Has such been observed by other of your contributors? They are said to devour seed-wheat sown near hedges, but why pull up and leave it? Thrushes I know will devour much grain, and even dry husk, as my aviary birds do constantly, though well supplied with soft food, worms, snails, &c.

HENRY STEVENSON.

Norwich, December 30th, 1873.

Notes from Leiston, Suffolk. By G. T. ROPE, Esq.

Noctule.—First seen on the wing on the 1st of April.

Harvest Mouse.—Picked up two dead ones at a recently-threshed wheat-stack in April. I afterwards caught a male, which I kept alive for some time, but have now lost: he escaped once before, and was loose in the room all night; but having placed his cage, containing food and water, upon the floor, with the door open, he again took possession of it, and was found in the morning coiled up in his nest.

Longtailed Field Mouse.—July 30th. Saw one of these mice on the beach, among some tufts of coarse grass.

Fieldfare.—Saw these birds for the last time on the 20th of May. With the exception of a single one seen throughout the summer at Blaxhall, probably a wounded bird, or ailing in some way, I heard of no fieldfares this autumn before the 3rd of November.

Blackbird.—Several times during this month (December) we have seen a pied bird at Blaxhall: it is an adult male, with a fine orange bill, and is black, with the exception of the cheeks, which are white.

Dartford Warbler.—December 16th. My brother picked up a dead bird of this species this morning at Leiston. Is not this a

new locality for this little bird? Yarrell, in the third edition of his 'British Birds,' makes no mention of its occurrence in Suffolk.

Redstart.—First seen on the 11th of April, at Knoddishall: a male.

Whinchat.—May 19th. Found a whinchat's nest this morning in the marshes; it was built upon the ground, and contained seven eggs.

Sedge Warbler.—April 30th. I this morning saw one of these birds singing on the wing, something in the manner of the meadow pipit.

Cole Tit.—On the 9th of June I found a nest of this species in the decayed stump of a Scotch fir, which had been broken off close to the ground. My attention was drawn to it in the first instance by seeing my dog sniffing at it. The nest contained eight partially fledged young birds, but all of them dead, having been drowned by the rain. Singularly enough, I found a nest of this bird in a precisely similar situation, two years ago, near the same spot, and in the same way, *viz.* by seeing a dog scratching at the hole; this also contained young birds.

Bearded Tit.—I am happy to say these beautiful little birds still hold their ground here. On the 13th of November, while walking through a large piece of reed-land in this parish, I fell in with three flocks, each containing from seven to nine birds. They are surprisingly tame, and may be watched while feeding, at the distance of only a few feet, provided the observer remains perfectly still.

Ray's Wagtail.—Saw the first pair of yellow wagtails on the 16th of April. On the 19th of May I found a nest of this bird upon the ground, under cover of some bent-down rushes. Saw the young off on the 9th of June.

Tree Pipit.—Observed one at Blaxhall in June. This bird is far from common in this neighbourhood.

Blackheaded Bunting.—A nest of this species found here in May contained eggs which differed considerably from their normal colouring; they were of a greenish white tint, some of them entirely without markings: one was slightly stained at the large end with pale brown. Observed the young out of the nest on the 4th of June.

Starling.—May 10th. This morning I heard a starling in the garden imitate very accurately the quick chattering of ducks on the wing, also the croak of the mallard. I think there is no other

British bird so good a mimic as this in the wild state. I have heard starlings imitate the notes of the peewit, curlew, jackdaw, and (I fancy) the heron. May 30th.—Young starlings are beginning already to congregate in small flocks with the parent birds.

Hooded Crow.—First heard on the 22nd of October at Blaxhall. This is later than in the three previous years.

Wryneck.—First heard on the 3rd of April.

Swallow.—First seen on the 1st of April near the sea.

Martin.—May 14th. Saw several house martins this morning. I have scarcely seen any before this date.

Turtle Dove.—First seen on the 7th of May. The crop of a turtle dove shot here, in a pea-field, in July, contained a large quantity of small seeds and a single pea. One of these birds was shot here as late as the 28th of November; it had been noticed several days before, frequenting a barley-stack: this was a young bird, and apparently a very late-hatched one.

Norfolk Plover.—First heard and seen at Leiston on the 9th of April. These birds are not uncommon in this neighbourhood, frequenting our sandy heaths by day, and going out regularly about sunset to feed upon the cultivated land, more especially fields of young turnips, where they keep up a tremendous screeching and squealing at intervals throughout the night.

Ringed Dotterel.—July 30th. Caught a partly-fledged young bird on the beach; directly it caught sight of me it squatted close to the stones, and the old birds tried hard to attract my attention from it, by running about close to me with a crouching attitude, and repeatedly uttering their soft musical whistle.

Redshank.—Found some redshanks a few days old on the 14th of May, and on the 29th another recently-hatched bird, also one nearly fully fledged. The stomach of a very young bird contained apparently nothing but black mud. This summer I saw one of these birds alight upon one of the sails of a mill.

Greenshank.—October 6th. Saw several greenshanks in the river between Snape and Iken.

Snipe.—We had several snipe breeding here this year; the first nest, containing eggs, was found on the 19th of April. In one nest the eggs differed a good deal from their usual colouring, the ground being of a very light greenish buff, with very few blotches of darker colour, and these only at the large end. On the 12th of May I found a nest in which the eggs were just hatching; the young birds were

remarkably strong on their legs, and the most beautiful little creatures imaginable, the colouring of their down being exceedingly rich and brilliant.

Jack Snipe.—I put up a jack snipe this spring as late as the 16th of April.

Spotted Crake.—A bird of this species was shot here on the 18th of September, but was too much mutilated for preserving.

Shoveller.—A young bird was killed near here on the 28th of April, probably bred somewhere in the neighbourhood.

Wild Duck.—April 23rd. Saw the first brood of young ducks off.

Garganey.—We had at least one pair of these little ducks breeding here this year. I first saw a pair in the marshes on the 15th of April. We have once or twice since seen a solitary male; and on the 15th of June I came suddenly upon a female, which evidently had young close by. During the end of July and the beginning of August we have several times seen on the wing a lot of about eight or nine young birds about the marshes. The voice of the male garganey is a low and very harsh grating croak, and that of the female a faint "quack," sharper than that of the wild duck.

Scaup Duck.—October 6th. I this morning saw a male which had been shot in the Alde, near Iken. The man who killed it said there were a pair of them, but he was only able to get one.

G. T. ROPE.

Ornithological Notes from Somersetshire.

By CECIL SMITH, Esq.

(Continued from Zool. S. S. 3628.)

JULY, 1873.

BUT little of ornithological interest has occurred here since my last notes, and that little is mostly a record of slaughter.

Wheatear.—Two young wheatears made their appearance on my croquet-ground during this month, and stayed about for a day or two; they were both young birds, almost in nesting plumage: it was very wild weather and blowing a gale from the west at the time. I mention this as, although the wheatear breeds on the Quantocks and along the coast, it seldom makes its appearance here, and then only a stray single visitant for a day or two on its first arrival in the spring.

Honey Buzzard.—On the 8th a honey buzzard was shot by the keeper at Cotheleston. He first saw it on the borders of a large wood on the side of the Quantock Hills; after chasing it from place to place and from tree to tree, he eventually succeeded in stalking up to it and shooting it. It was a young bird, probably in its second year, as the gray feathers of the head of the adult were gradually supplanting the darker brown ones of the young bird. I did not see this bird, and was not told of it till more than a month afterwards, as both the keeper and the birdstuffer at Taunton, to whom it was taken, believed it to be a common buzzard; so I can give no further particulars as to contents of stomach, &c. The bird is now in the possession of Mr. Esdaile, on whose ground it was shot.

SEPTEMBER, 1873.

Sparrowhawk and Partridge.—On the 15th I was out shooting with a friend at a place called Pitsford Hill, near Wiveliscombe, and as the keeper and myself were marking a covey of partridges we saw a large female sparrowhawk strike at the last bird of the covey, which was lagging considerably behind the others. The moment the partridge became aware of the hawk it dropped like a stone into a thick hedge over which it was passing; the hawk retired into a tree close by, and there remained, probably waiting for the partridge to move. We went on shooting, and on returning to the place in about an hour we found the hawk still in the tree, and, after some difficulty, rose the partridge from the exact spot in the hedge into which we had marked it drop. Neither of the birds were shot at, so they may have renewed their acquaintance on another occasion.

Buffon's Skua and Pigmy Curlew.—On the 18th of this month Mr. Haddon, of Taunton, shot a Buffon's skua near Stolford, on the coast, near Quantox Head. I afterwards saw it at Mr. Bidgood's, who had it to stuff: it was a bird of the year, in the dark sooty plumage. Buffon's skua is a rare bird in this county, though it does occur both inland and on the coast, and occasionally in nearly adult plumage; one such was recorded by the Rev. M. A. Mathew in the 'Zoologist' for 1863 (Zool. 8448). The curlew sandpiper was also shot by Mr. Haddon at the same place and on the same day: he told me he thought there were one or two others in company with it, but he was unable to obtain another. This bird seems only to occur occasionally on our coast; it is, however,

much more common and regular in its appearance on the north coast of Devon.

OCTOBER, 1873.

Wigeon.—In the 'Zoologist' for 1872 (S. S. 3243) I mentioned that a pair of wigeons had bred in my pond that summer, and had eight young ones, only two of which arrived at years of maturity. As I never pinioned these two, but left them to their own devices, they left me in the following spring—that of 1873: early in this October, however, they reappeared in my pond—at least I presume they must be the same two birds, as they are perfectly tame, and come and feed with the rest of the ducks, and did so directly on their return. This return is interesting, as it shows not only a disposition to take up their winter quarters in the same place from year to year, but it also shows nearly the time at which the drakes assume their distinctive plumage. When they departed in the spring they were both alike, and I do not think it was possible to say whether they were ducks or drakes. When they returned in October the drake had quite assumed his distinctive plumage; the duck, however, as might have been expected, remained much as she was, there being but little difference between the young ducks and drakes.

Peregrine Falcon.—On the 9th I saw at the Taunton Museum a peregrine falcon, a fine young female, which had been killed at or near St. Audries, and had been sent to Mr. Bidgood to preserve for the Museum.

NOVEMBER, 1873.

Redlegged Gull.—On the 10th I saw, in a newly-sown field of wheat near Willett Hill, a flock of about fifty gulls, consisting, as far as I could see, entirely of redlegged gulls (*Larus ridibundus*). It is not very usual to see so many of these gulls collected in a field so far inland; but I suppose the freshly-moved ground attracted a few stragglers, and the rest collected in that marvellous manner in which a crowd of gulls is soon formed when a few lucky individuals find a good feeding-place: in this case I have no doubt the whole flock had a good feed of grubs. This gull is common enough on our coast from autumn to spring, and I have frequently seen them collect in the same way in ploughed fields near the sea, but not often so far inland: there was nothing particular in the weather to account for it.

Peregrine Falcon.—On the 24th another peregrine, also a young female, was shot near Milverton by a boy who was out with a gun: the boy's father brought this bird to me a few days afterwards: it was fat and in very good condition, though there was nothing in the stomach but a little fur, which might have been that of a hare or rabbit.

DECEMBER, 1873.

Common Buzzard and Brown Owl.—On the 1st two common buzzards were brought to me by the keeper at Cothelestone, with the following note giving an account of the capture. I had been shooting there the day before. "Sir,—You will remember a pigeon being shot at the corner of Badger Coppice, and falling into the field? I went for it when we had finished shooting, and found the buzzard eating it. I had a trap set, and caught it the same evening. The one with its leg broken was caught at a pigeon the same evening by Grub Bottom." The two places mentioned are on the south-east side of the Quantocks, and not far from where the honey buzzard was killed. Another common buzzard was shot or trapped by this same keeper about a fortnight before. I think a note of the capture was sent you by Mr. Mathew. I much fear that this system of trapping, so vigorously carried on by keepers, will soon quite exterminate not only the common buzzard, but all our hawks and owls. My friend the keeper is quite as ruthless a destroyer of brown owls as he is of buzzards; for he says that they (the brown owls) carry off his young pheasants in great numbers at night from the coops. If he is to be believed, the way in which the owls effect this robbery is curious and daring. He says they fly by the coop so close as to disturb the hen while she is hovering her young; she jumps up in a rage, the young ones run out, and some are of course carried off by the owl. I am not generally a great believer in a gamekeeper's Ornithology, or his evidence against what he calls "feathered vermin;" but this story about the brown owls was told with much confidence, the keeper declaring he had often watched and seen them do it. But to return to the buzzards sent me on the 1st: one of these I gave to the Museum at Taunton; the other I skinned myself, and afterwards examined the contents of the stomach, which rather surprised me; for in it I found a considerable portion of the gizzard of some other bird; a good many grains of barley and a few of wheat; a considerable mass of what looked like chopped-up bents of grass; a very few feathers, the claw and part

of the skin of the foot of some bird; several earwigs, some quite digested, nothing but a little of the hard skin being left, and the others had only just been swallowed and were quite perfect; some little bits of bones of some small bird; there were also a great many small white stones. How much of this miscellaneous mass is to be set down as the buzzard's own food, and how much was taken out of the stomach of some other bird, I am rather at a loss to say. The gizzard was a strong grinding one, much more powerful than the stomach of the buzzard, and I have no doubt was that of a wood pigeon; the wheat, the barley, the bents of grass, and the small stones (which are always present in the stomach of the wood pigeon), were no doubt eaten with that bird; the earwigs were probably eaten by the buzzard itself, but I do not know that they form part of its usual food, or how that bird manages to catch them.

In concluding these notes, I must express my regret that so many of our finest hawks have been slaughtered during the past six months,—namely, two peregrine falcons, three common buzzards, and one honey buzzard. If this continued persecution is carried on, all our larger Falconidæ will soon become extinct. I am quite sure that this destruction has already been of serious injury to the farmer, and I believe has not been of much use to the gamekeepers, some of whom are already complaining of the difficulty of guarding their young birds from the attacks of rats, which are increasing to a most mischievous extent.

CECIL SMITH.

Fish distinguished by their Action.

By W. SAVILLE KENT, Esq.*

As the trained eye of a constant resident in the country enables him to recognize the various species of birds that cross his path by their flight, irrespective of their form and colour, so the observer of fish as they wander at will in the tanks of a large aquarium soon learns to invest them with an additional marked individuality imparted by their mode of action. In some instances these distinctive characters are instructive, as illustrating the varied mechanical

* I am indebted to Mr. Kent for sending me a copy of this paper, which appeared in the columns of 'Nature' in July last: it exhibits careful observation, and I am particularly desirous it should be seen by the readers of the 'Zoologist.'—E. N.

principles on which locomotion is effected, while in others they are highly valuable as affording accessory means of discriminating the zoological affinities of the different races and species.

Commencing with the Plagiostomous order, we find in the two primary sub-groups, including respectively the sharks and rays, that progression is effected on very distinct principles. With the Selachioidea, or shark tribe, the fish move by the even, powerful swaying from side to side of the largely-developed and unsymmetrical caudal fin and whole posterior part of the body, the other fins remaining quiescent and being merely subservient as balancers. Descending to the species, we find again that each form exhibits a peculiarity of action distinct from its congeners, and one which readily enables us to discriminate between them. Thus in the smooth hound (*Mustelus*) the pectoral fins are so largely developed that their balancing powers are highly augmented; comparatively slow motion of the caudal extremity suffices to propel the fish through the water, and the whole body being flexible, it progresses with a measured grace of action surpassed by no other species of its tribe. In the picked dogfish (*Acanthias*) the general contour of the body is very similar to that of the last species, but the pectorals being much smaller, more rapid action of the caudal extremity is requisite for supporting it in the water, and to this has to be added a great rigidity of the anterior half of the vertebral column, causing the fish to swerve from side to side with each stroke of the tail, the same cause preventing it also from turning corners with ease and rapidity, and altogether imparting to it a want of grace of action compared with that of other members of its tribe. For the foregoing reason, this species requires a tank of larger size for its preservation in good health than other dogfish, as if confined within the boundaries of a small one, it beats its head against the sides and rockwork to such an extent that the cartilage of the skull is frequently exposed to view. In the spotted dogfish (*Scyllium*) the whole body is more elastic even than in *Mustelus*, a character admirably fitting it for its ground-loving habits, and enabling it to explore and adapt itself to every sinuosity of the ground while hunting for its prey. When swimming in open water it is distinguished by a more rapid action and swifter progress than *Mustelus*, though at the same time the greater amount of force expended in its movements deprives it of the peculiar grace associated with that species.

One anomalous form, standing, as it were, between the sharks and rays,—the monk, or angel-fish (*Rhina squatina*),—affords in its locomotive characters an interesting link further indicating its close affinity rather with the former than with the latter group. The habits of this fish are essentially nocturnal, and throughout the daytime it usually reclines sluggishly at the bottom of its tank. Its depressed body and broadly expanded pectoral fins resemble those of a ray more than a shark, and like the former fish it seeks concealment by burying itself beneath the sand or shingle, excavating a hole with the shovel-like action of these broad fins, and thus waits in ambush for passing prey. Immediately the monk-fish rises above the surface of the ground its true affinities become apparent, progression being effected entirely by the lateral action of the caudal extremity, as in the sharks, though in a more slow and clumsy manner. The lateral position of the gill-openings in this fish forms its chief shark-like anatomical character, and to this has to be added its viviparous habits.

In the Batoidea, or ray tribe, onward motion is accomplished by a singular, even, and wing-like action of the broad pectoral fins, the attenuated caudal extremity remaining perfectly quiescent, and serving only to preserve the fishes' equilibrium. Swimming towards the surface of the water, these fish present a most remarkable bird-like aspect, their large flapping fins reminding the observer of the flight of the heron or some other unwieldy representative of the Grallian order, while the slender tail dependent in the rear suggests the characteristic mode in which those birds hold their long legs, while pursuing their course through the more subtle medium which they inhabit.

Proceeding to the Teleostean group, we find the means by which the same organs are made subservient to the faculty of locomotion, still more highly diversified; space, however, will only admit of a few selections.

In the gurnards (*Trigla*), during rapid movement, all the fins are pressed closely against the body, the broad wing-like pectorals being shut up like a fan, while the fish is propelled swiftly through the water by the vigorous undulations of the tail; when the fish moves leisurely the pectorals are opened to their full extent, acting as balances. In many species, such as the striated gurnard (*T. lineata*), these fins are brilliantly coloured, reminding the observer, especially when regarding them from above, of gorgeous

tropical butterflies, gliding along with the smooth action characteristic of the *Vanessa* tribe. Yet a third property of motion is possessed by these remarkable fish. Settling on the ground at the bottom of the water, they are capable of literally walking over it by means of the three free rays of the pectoral fins, which are situated a little in advance of the others, and are curved and especially thickened, to adapt them for their anomalous office.

The gemmeous dragonet (*Callionymus lyra*), a small and beautiful fish somewhat resembling the gurnards in outward appearance, is distinguished by an essentially different mode of progression. The habits of this species are rather sluggish; it spends much time reclining on the ground, occasionally moving for short distances just above its surface, by the flitting action of the delicate pectoral fins. On ascending towards the top of the water, its swimming capacities are shown to be very limited, being restricted to the weak vibrations of the pair of fins above mentioned, and which impart to it a peculiar jerky action. The male in this species is recognized by the extraordinary length of the first ray of the anterior dorsal fin, which is raised and depressed at pleasure like the latteen sail of a Mediterranean fishing-yawl. This singular appendage appears, from my own observations of the species in confinement, to be subservient to the same end as the wattles, crests, and other abnormal adjuncts of the male in the Gallinaceous birds—for the purpose of fascinating their mates; to this is added a similar heightening of the colour, which is carried to such an extent in this fish that the two sexes were long regarded and described as separate species, under the respective titles of *Callionymus lyra* and *dracunculus*.

In the pipe-fish and sea-horses (*Syngnathus* and *Hippocampus*), representatives of the Lophobranchii, the organs of locomotion are reduced to their minimum, being often restricted, in the former genus, to a single median dorsal fin, and being at the most supplemented by a pair of diminutive pectorals and a rudimentary caudal. In all cases this dorsal fin is the chief propelling instrument, and in motion, rapidly undulating from end to end, illustrates the action of the Archimedian screw, driving the fish through the water on the same principle. Dr. J. E. Gray was the first to point out this remarkable peculiarity, in the case of *Syngnathus*, from observing these fish in the aquarium at the Zoological Gardens. In both

Syngnathus and Hippocampus the animal usually assumes a vertical position while progressing through the water.

The John Dorée (*Zeus faber*) affords us an example of the same principle noticed in the Syngnathidæ, applied to the purposes of locomotion, though in a still more remarkable and extensive degree. One of these singular-looking fish added to the Brighton tanks about two months since has continued in perfect health up to the present time; and, although of shy and retiring habits, has already yielded many points of interest in connection with its life-history. The ordinary position assumed by this fish is the neighbourhood of some projecting rock near the bottom of its tank, and against which it sometimes inclines in a leaning posture, remaining motionless for hours together. Its ordinary progress from place to place is remarkably slow, and it is only when on rare occasions it rises high in the water that the beautiful mechanism that guides its movements can be appreciated. It may then be seen that the only organs called into action are the narrow and delicate membranes of the posterior dorsal and anal fins, each of which vibrates in a similar manner to the single dorsal of the pipe-fish; the long filamentous first dorsal, pectorals, ventrals, and caudal fins meanwhile remaining perfectly motionless. Thus this wary fish, with an almost imperceptible action, silently and stealthily advances upon its intended prey, engulfing it in its cavernous mouth almost before the hapless victim is aware of its enemy's approach.

W. SAVILLE KENT.

*The Denizens of Aquariums.** By EDWARD NEWMAN.

Seals.—I am induced by Mr. Kent's able paper to make public a few observations of my own, not very new or very recently made; and I will begin with seals, lung-breathing animals, which I fear we shall never see at the Crystal Palace, on account of Mr. Lloyd's conscientious objection to their introduction,—an objection which happily is not felt at Brighton, so that the visitors of that establishment are there allowed the opportunity of observing the peculiar actions of these most interesting animals. My first acquaintance

* Having eschewed the language of Science for so long a period, I cannot adopt it now: our friend Mr. Lloyd uses it in a preceding paper, doubtless fearful that his continental friends might fail to understand our English plural *aquariums*, but I cannot persuade myself to follow him.

with seals was made at Roundstone, in Connemara, in July, 1839, where I had abundant opportunity of seeing them at home: the date seems to take me back into the dim ages of remote antiquity, but memory still reproduces with the utmost clearness the facts then observed. Nothing can be more smooth and comfortable than the manner in which a seal slides or glides or launches himself into the water; it seems the result of gravitation only, and often independent of muscular exertion; but when he leaves the water these conditions are exactly reversed; then his efforts are most laborious, and he reminds us of a man jumping in a sack; his progress consists of a series of spasmodic and ineffectual jerks, which he fondly mistakes for leaps: he verifies most minutely Virgil's celebrated apothegm:—

“Facilis descensus pelagi.

* * * * *

Sed revocare gradum superasque evadere ad auras

Hoc opus, hic labor est.”

How often have our moralists applied this passage to poor man's facilities for transgression and the difficulty of his return to rectitude; but with the alteration of a single word, the seal gives us a far more apt illustration of the poet's meaning. *Revenons à nos moutons*; I must put Virgil on the shelf and return to my denizens. The moment a seal has fairly launched himself in the water, he turns over on his back, and swims in this reversed position: incredible as it may appear, he will be quite willing at any time of the day to verify this at Brighton, and will convince the most sceptical of the truth of my assertion. Why is this? wherefore should a seal swim on his back with his stomach uppermost? Let us speculate a moment. If we attentively study the position of his eyes, we shall see that they are placed so as to look upwards with the greatest ease, and thus apprise him of all dangers when on land or on ice. Such enemies as man and the white bear, both of whom are ever on the look out for him, are thus readily perceived, and often by a timely movement avoided. When in the sea it is different; his object then is to feed; men and bears do not pursue him so incessantly or so availingly in the deep; but his food swims beneath him, and to be eaten must be caught, and to be caught must be seen. The seal has no means of dredging the sea; he must see and pursue each individual fish on which he desires to feed. The eyes of a seal are placed in the best possible position for perceiving men and bears when on land and ice and

fishes in the sea: were it reversed he would not long maintain his amphibious existence.

Well then, as to the action of swimming, how is this performed? partially by his paddles and partially also by the movements of his spinal column. I am told,—and I believe it notwithstanding the danger of accepting any “I am told” in Natural History,—that whales and porpoises invariably move the vertebral column vertically—that is, upwards and downwards; now it is well known that fishes move the spinal column from side to side or horizontally; this may be seen every day in an aquarium. Seals adopt the plan of fishes, and swing their vertebral column and posterior extremities from side to side. I never cease to regret having missed the opportunity of seeing the porpoises at Brighton: it may not occur again: then indeed I might have witnessed and verified that vertical action which now I am obliged to take for granted. It must be admitted that the structure of a porpoise entirely favours this conclusion, but how often are conclusions from structure erroneous, because we mistake the meaning of the structure.

Turtle.—The action of a turtle in the water is very beautiful; his anterior paddles move slowly, sedately, and simultaneously, like the wings of a rook returning at eventide from its wearisome and monotonous labour of delving in the earth for wireworms; faithful slave of man, it receives a slave's reward.

Mackerel.—A word on mackerel: our friends at Brighton have succeeded in keeping mackerel alive for weeks—a great triumph, but, alas! the result is disappointing: the mackerel is of all fishes the least graceful, the least easy in its movements: possessing a form the very model of symmetry, it nevertheless swims with difficulty and apparent timidity, just as a human being afflicted with lumbago is reluctant to move a muscle from a dread of the consequences.

The Sleep of Fishes.—How often has the enquiry been made, Do fishes sleep? and how futile and unsatisfactory have been the answers; I suppose scarcely any one recollects a clear and decided solution. The question may be extended and enlarged, and fishes, with regard to the act of taking rest in sleep, may be divided into diurnal and nocturnal, a division which I may state, with some degree of confidence, has never been worked out. Before you can answer the simple question, Do fishes sleep? you must of necessity inform yourself of the habits of the fish you would place in the

witness-box, and must know of a certainty whether they are diurnal or nocturnal. If you find that fishes of any particular genus,—*Labrus*, for instance,—are incessantly in action during the day, always roving about seeking food or pleasure, perhaps striving to display their splendid colouring, or perhaps simply desiring to convince wondering visitors that they have discovered perpetual motion,—be this as it may, you may pretty safely conclude that these beautifully decorated wrasses are not to be caught napping while the sun is above the horizon. Visit them in the dead of night and with a lantern, and you will find that a change has come o'er the scene; the perpetual motion, as in so many other instances, has come to a dead stand; the machinery is out of order and has ceased to work: the wrasses are scattered about in a variety of attitudes and are perfectly motionless; some are on their sides, some seem to be jammed in the crevices of a rock, some seem to be standing on their noses, and some on their tails: none make any attempt at motion, unless when the light of the lantern is brought to bear on them too brightly or too suddenly. We may fairly conclude when they exhibit these appearances that they are asleep,—that they are really taking rest in sleep,—and thus the question would be solved as regards wrasse.

But look on those algophagous gray mullet; they swim about in mid-water by day soberly and sedately, too aristocratic to take notice; too confident of safety either to hurry or to hide; they seem to be enjoying a waking dream, but there is no evidence that they are asleep. At night how different the scene; then they are all on the surface, and all in a state of the greatest activity, most of them have the dorsal fin actually out of water: these are truly nocturnal fishes; it is impossible to catch them asleep by night, and we have no evidence that they sleep by day: therefore they do nothing towards solving the question, Do fishes sleep?

It may be observed that the absence of an eyelid and the consequent absence of the power to close the eye, are facts which have evidently induced the erroneous conclusion that fishes cannot sleep.

EDWARD NEWMAN.

Curious Instinct in the Mole.—Being much annoyed by moles, I set a trap in a large warren, which was at first successful. Having, however, reset the trap, I was surprised, two days after, to find that the mole on coming to the trap had made a hole to the surface, and then, passing over

the ground, had re-entered the run beyond the trap, and so escaped. The holes were filled in, and in two days the same thing occurred again. The trap had not been sprung in either instance.—*J. A. Foster; Hilston, Hull, January 10, 1874.*

White's Thrush near Grampond, Cornwall.—One of the keepers of Mr. C. T. Hawkins, of Trewithen, in the parish of Probus, killed a day or two since what proves to be a valuable addition to our Cornish Avifauna, in a very fine specimen of White's thrush, which was kindly conveyed to me by the courteous attention of his steward, Mr. W. Trethewey, who at once detected it as different from any other thrush he had ever seen, and forwarded it to me for my museum. It differs in no one particular from the bird shot by (I think) Lord Malmsbury, which is described by Mr. Yarrell, in his 'British Birds.' I think it therefore superfluous to give a description of the plumage, and shall content myself by giving the following particulars, which will answer the purpose of the 'Zoologist' in every respect:—

Length	-	-	-	-	-	-	12½ inches.
Tarsus	-	-	-	-	-	-	1½ "
From carpal joint to end of first quill	-	-	-	-	-	-	6½ "
Wings extended	-	-	-	-	-	-	20½ "

Weight, 6½ ounces. Number of tail-feathers, 14.

Mr. Trethewey writes, "The bird attracted the notice of the keeper for some weeks before he had an opportunity of shooting it. Each time he saw it, it was feeding in some marshy ground near some ponds, and when disturbed it flew to another portion of the water. The keeper thought it was a species of water-fowl. The cry was very much like that of the common thrush, but the habits quite different."—*E. H. Rodd; Penzance, Jan. 15, 1874.*

Siskins near Mansfield.—On the 10th of November a flock of siskins were seen on the alders round my pond: I shot eight of them. They were in very good plumage, the yellow on the males being very bright. They were about for a week, and I saw from fifteen to twenty of them: there were also a few redpolls in the flock. They reminded me very much of the tits, as I saw them hang in a great variety of attitudes in order to get at the seeds in the cones. The ground beneath the trees was scattered all over with fragments of cones and the husks of the seeds. The birds were very tame, and allowed me to get quite close to the tree, so that I had a good opportunity of observing their movements.—*J. Whitaker, jun.; Rainworth Lodge, Mansfield.*

The Lesser Redpoll not in Spitsbergen.—My friend Mr. Eaton was good enough to give to the Museum of the University of Cambridge the skin of the redpoll mentioned by him (Zool. S. S. 3805—3808) as having been obtained in Spitsbergen. It is that of the true *Fringilla linaria* of

Linnæus,—that is to say, the mealy redpoll,—and not of the lesser redpoll, as Mr. Eaton calls it. The last, as I before have had occasion to point out (Zool. S. S. 2223), has by no means a high northern range.—*Alfred Newton*; January 6, 1874.

Late Martins and Swallows.—Nov. 2, 1873. About 8 A. M. I saw two swallows flying over the field and garden. They remained circling backwards and forwards for some time, flying quite low. Nov. 19.—This morning I noticed two martins flying up and down Upper West-street, Reigate. Later in the day I saw one flying backwards and forwards in front of this house. Nov. 30.—About 3 P. M. I observed six martins flying over the grassy slope on the east side of the nut-wood in Gatton Park, where they were sheltered from the wind. Some of them were skimming along close to the ground.—*Albert J. Crosfield*; *The Dingle, Reigate*.

Corn Crake.—Has it been observed in other localities that this species has been far from common this season? I did not hear the notes of this bird till the 9th of May, which was nearly a fortnight later than the average date in previous seasons; indeed in 1868 I heard it as early as the 18th of April, and in other seasons I have always heard it between the 22nd and 30th of April. Not only was the bird late in its arrival, but I did not hear it a dozen times during the whole of the summer, although in previous seasons its “crake” was almost as constant and familiar in the evenings as the pleasant twitter of the sand martin. Almost every summer before this I have had eggs of the species brought me by mowers, who had mown them out of the grass in the meadows, but this season I have not seen an egg, so I have come to the conclusion that the bird must be comparatively rare—at least in its old haunts near here. I may here state that I saw a specimen of the spotted crake on the 16th of April, which had met with its death by flying against the telegraph wires, and its head was almost severed from its body.—*G. B. Corbin*.

Note on the Water Rail.—On the 31st of December last, whilst shooting with my brothers in some reedy meadows bordering the Test, about two miles below Stockbridge, Hants, we were surprised by the loud and singular cries of water rails, which were particularly numerous in that locality. We had heard these birds occasionally some ten miles higher up the river, but never to the same extent as on this occasion. The note was peculiar, and may best be described as a sharp loud whistle, very “resonant,”* not at all harsh or grating, reminding one somewhat of the note of the green sand-piper, and of extraordinary power for so small a bird. On one occasion the cries were uttered with scarcely any intermission for several minutes, and so loud as to impress one with the idea of two birds being engaged in angry conflict; and this came from a patch of small reeds close to which we were standing, though unable to discover the author or authors. During the

* Stevenson's ‘Birds of Norfolk,’ vol. ii. p. 407.

three or four hours we were in the meadows we heard the rails at intervals, and long after sunset, whilst waiting for the evening flight of ducks, their loud shrill cries were borne from the thick herbage and sedge which clothed the banks of a neighbouring pond, sounding particularly distinct on the still winter's night. I do not know whether the note of this bird has been heard at any other time than during the spring or summer; but, as far as I can learn, it seems hitherto only to have been noticed at those periods. On the 3rd of January, 1874, my brother shot a very beautiful specimen. The beak where it is usually reddish orange is brilliant coral-red; and the tints of colour throughout the plumage are more vivid and clearly defined than I have seen in any other example.—*H. Durnford; Stanley Road, Waterloo, Liverpool, January 9, 1874.*

Egyptian Geese in Nottinghamshire.—On Friday, the 5th of December, 1873, six Egyptian geese were seen on the Trent, near Clifton Hall; two of them were shot by the gamekeeper of Mr. J. Watson. The birds were in beautiful plumage. This is their first occurrence in Nottinghamshire. Since writing the above two others have been killed on the Trent near Nottingham.—*J. Whitaker, jun.*

Note on the Occurrence of the Greater Shearwater in Bridlington Bay.—A fine specimen of the greater shearwater (*Puffinus major*, Faber), was killed in Bridlington Bay, near Flamborough Head, by Mr. M. Bailey, on the 10th of January; and both this and the Sabine's gull recorded by me from the same locality, in the 'Zoologist' for 1873 (S. S. 3802), have been added to the collection of my son, Mr. J. H. Gurney, jun. The shearwater is a male bird, and in very nearly adult plumage; whereas four other examples from the same locality, recorded by Mr. Boulton in the 'Zoologist' for 1866 (S. S. 29) and for 1867 (S. S. 543), were all immature. The only remains of immature plumage in the specimen recently obtained are the following:—The under tail-coverts are fuliginous, but with each feather narrowly tipped with dirty white; the tibial feathers are entirely fuliginous, and an irregular fuliginous stripe of the average breadth of about an inch and a half runs up from the vent to the centre of the breast. There are also a few fuliginous spots on the upper part of the flank nearly adjacent to the shoulder-joint. The following memoranda as to the colour of the bill and feet were taken nine days after the bird was shot:—The bill is purplish black, with the tinge of purple strongest in the lower mandible, but the hooked tip of the upper mandible is bluish gray. The dark colour of the bill in this species contrasts strongly with the pale-coloured bill of its Mediterranean congener (*P. cinereus* of Bree's 'Birds of Europe'), in which the bill is also much more robust than that of the present species (*P. major*, Faber). In the present specimen the legs and feet are of a very pale flesh-colour, except the outer side of the tarsus and of the outer toe, and also the outer edges of the claws and webs, all of which are dark purplish flesh-

colour; this tint also runs up each web from the edge to about half way up the foot, forming a dark mark in the web nearer to the two external toes than to the middle one. The remaining portions of the webs are very pale flesh-colour, slightly tinged with greenish. The gizzard of this specimen was small but muscular, and remarkably roughened on the internal surface; its contents consisted of the horny jaws of about half a dozen small cuttle-fish, the jaws varying in size from a sixteenth to a quarter of an inch in diameter. Similar remains of cuttle-fish have been found in the stomach of the fulmar,* and Mr. Layard, in his 'Descriptive Catalogue of the Birds of South Africa,' states (at p. 364) that a similar diet is in vogue amongst the albatrosses of the Southern Seas, from the stomach of one of which he took "a handful of hard, horny, parrot-billed-shaped jaws."—*J. H. Gurney; Northrepps, January 19, 1874.*

Ornithology of the Orkneys.—Having spent many months, at all seasons of the year, among the islands of Orkney, engaged in collecting specimens of Natural History, and more especially of birds, and having taken great trouble to procure information on the spot respecting the occurrence of rare species, and in observing the life-histories of the more common kinds of birds, I have been induced to prepare for publication a small work bearing on the above subject; and up to May next I shall be much indebted to any readers of the 'Zoologist' for information of any kind whatever relating to the Mammalia, birds, insects, Botany, &c., of the Orkneys. Please address:—*Captain Clark-Kennedy; Guards Club, Pall Mall, S.W.*

Proceedings of the Entomological Society.

5th Jan. 1874.—Prof. WESTWOOD, M.A., F.L.S., President, in the chair.

Additions to the Library.

The following donations were announced, and thanks voted to the donors:—'Proceedings of the Royal Society,' No. 147; presented by the Society. 'Bulletin de la Société Impériale des Naturalistes de Moscou, 1873,' No. 2; by the Society. 'Catalogue of the Specimens of Hemiptera Heteroptera in the Collection of the British Museum,' part viii., by Francis Walker; by the Trustees. 'On the Origin and Metamorphoses of Insects,' by the Author, Sir John Lubbock, Bart. 'Contributions to a Knowledge of the Curculionidæ of the United States;' by the Author, George H. Horn, M.D. 'Sixth Annual Report of the United States Geological Survey of the Territories embracing portions of Montana, Idaho, Wyoming and Utah; being a Report of Progress of the Explorations for the Year 1872,' by F. V. Hayden, United States Geologist; by the Author. 'Synopsis of the Acrididæ of North America,' by Cyrus Thomas, Ph.D.; by the Author.

* See note by Mr. J. H. Gurney, jun., in 'Zoologist' for 1868 (S. S. 1483).

'Exotic Butterflies,' part 89. 'Lepidoptera Exotica,' part xix., and 'Cistula Entomologica,' part viii.; by E. W. Janson. 'L'Abeille,' 1873, livr. x., and 1874, livr. i.; by the Editor. 'The Canadian Entomologist,' vol. v., nos. 10 and 11; by the Editor. 'The Entomologist's Magazine' for January; by the Editors. 'Newman's Entomologist' and 'The Zoologist' for January; by the Editor.

Election of Member.

Captain George Cockle, of 9, Bolton Gardens, was balloted for and elected a Member of the Society.

Exhibitions, &c.

Mr. Meldola exhibited some photographs of minute insects taken with the camera obscura and microscope.

Mr. M'Lachlan called attention to a paper in the last part of the 'Annales de la Société Entomologique de France,' by M. Bar and Dr. Laboulbène, on a species of the Bombycidae closely related to the tiger-moths described and figured by M. Bar as *Palustra Laboulbenci*, and of very extraordinary habits, the larva being aquatic, living in the canals of the sugar plantations in Cayenne, and feeding upon an aquatic plant. The hairy larva had all the form usual for the group, and breathed by means of small spiracles—a supply of air being apparently entangled in its hairs. The cocoons were joined together in little masses floating on the surface of the water.

Mr. Butler remarked on a paper by Mr. J. V. Riley, in the 'Journal of the S. Louis Academy of Sciences,' in which he alluded to *Apatura Lyeon*, *Fab.*, and *A. Hyrse*, *Fab.*, as distinct species: but which he (Mr. Butler) believed to be closely allied to, if not identical with, *Apatura Alicia*, *Edwards*.

Mr. M'Lachlan read a letter that he had received from M. Ernest Olivier, stating that the collection of insects formed by his grandfather had been purchased some years after his death by MM. Chevrolat and Jousselin. A great part of the collection had been suffered to fall into decay; but recently a portion, comprising the Curculionidae, Heteromera, Lamellicornes, Sternoxi, Chrysomelidae, Clavicornes and Hydrocantharidae had come into his possession, and he would be happy to show them to any English entomologist who might desire to examine any of the numerous types. Unfortunately the Carabidae and Longicornes were almost entirely lost.

Papers read.

Mr. Smith communicated a paper on the Hymenopterous Genus *Xylocopa*; and Mr. D. Sharp a paper on the Pselaphidae and Scydmanidae of Japan, from the collections of Mr. George Lewis.—*F. G.*

Notices of New Books.

The Depths of the Sea; an Account of the Dredging Cruises of H.M.S.S. 'Porcupine' and 'Lightning' in 1868, 1869 and 1870. By C. WYVILLE THOMSON, LL.D., &c. London: Macmillan & Co. 1873.

THREE years after the completion of these Cruises we are here presented with the results. It is difficult to state with precision the value of these results: it is difficult to say to what exact extent the boundaries of human knowledge have been enlarged, and whether the extension, be it what it may, offers an adequate return for the labour and money expended in its production: opinions on these points will widely differ, and I do not propose to enter on these questions, or to discuss directly or indirectly the *cui bono* of these laborious cruises. It is sufficient for my purpose to say that both expeditions were undertaken by the Admiralty at the instance of the Council of the Royal Society, and that it was thought right that such an account should be laid before the general public as might stimulate others, who have the proclivities and the opportunity, to penetrate further into the new and strange region on whose borders the three naturalists whose names are associated in the work have been among the earliest to make systematic inroads.

It must, however, be understood that this volume, although not the official record, has the full weight and authority of such record, and that notwithstanding the name of Dr. Thomson stands alone as the author of the work, it must be considered as combining the observations of three of our most distinguished marine naturalists, Dr. Carpenter, Mr. Gwyn Jeffries and Dr. Wyville Thomson. It was originally intended that the work should have been the joint production of these three, but difficulties in the way of such a course seemed to present themselves, and it was finally decided that Dr. Thomson should be the sole reporter, a decision we must accept as satisfactory in every respect.

The readers of the 'Zoologist' are fully aware that it is by no means a first attempt to dredge the deep sea in search of knowledge—knowledge not only of its inhabitants as new and undescribed members of the world of animals, but also for the

purpose of ascertaining with precision the exact bathymetrical limits of life: the late Edward Forbes conducted a series of researches with the same object some years previously.

I have already stated in these pages that no ray of light can penetrate the deepest recesses of ocean, and it appears that vegetation can scarcely exist without light, therefore the limit of vegetation is probably ascertained with something approaching to precision, but the limits of animal life seem to elude this scrutiny and to recede before the penetrating glance of the dredger, notwithstanding the vain guessings of those who were the first to speculate on these hidden mysteries. It would seem very erroneous opinions have resulted from this system of guessing, and have been current as Nature's laws. This trio of naturalists have done much to dissipate such errors, and now that another expedition, that of the 'Challenger,' is afloat under the same auspices, we cannot doubt that reliable conclusions will be obtained and published.

The narrative of the cruises are kept quite distinct, that of the 'Lightning,' first in order of time, takes the first place in Dr. Thomson's narrative. She steamed from Pembroke on the 4th of August, 1868, and reached Oban on the 6th. Here Drs. Carpenter and Thomson joined. Dr. Carpenter was accompanied by his son Herbert. On that evening they anchored at Tobermorey, and after a gusty passage through the Minch reached Stornaway in the Lews on the evening of the 9th. About fifteen miles north of the Butt of Lews the first haul was taken, just for the purpose of testing the tackle and of tracing the limits of shallow-water species. The dredge worked well, but brought up few animal forms, and all of them well-known inhabitants of the seas of the Hebrides.

From Stornaway the 'Lightning' steamed northwards towards the Færoe Bank, so celebrated for their cod-fishing. Although the principal object of the fleets of English and Foreign smacks which frequent this bank is to procure fish for curing, yet many of the English ones are welled for the supply of fresh cod for the London market. These welled vessels are familiar to most Londoners, but the following paragraph from the volume before us will be acceptable to many:—

"A large square tank occupies the middle of the vessel, and holes in the sides allow the water to pass freely through it. The water in the tank is thus kept perfectly fresh; the best of the cod are put into it, and they stand the voyage perfectly. It is curious to see the great creatures moving grace-

fully about in in the tank, like gold fish in a glass globe. They are no doubt quite unaccustomed to man, and consequently they are tame; and with their large, smooth, mottled faces, their huge mouths, and lidless, unspeculative eyes, they are about as unfamiliar objects as one can well see. They seem rather to like to be scratched, as they are greatly infested by Caligi and all kinds of suctorial copepods. One of them will take a crab or a large *Fusus* or *Buccinum* quietly out of one's hand, and with a slight movement transfer it down its capacious throat into its stomach, where it is very soon attacked and disintegrated by the powerful gastric secretion. In one welled smack I visited on one occasion, one of the fish had met with some slight injury which spoiled its market, and it made several trips in the well between London and Færoe, and became quite a pet. The sailors said it knew them. It was mixed up with a number of others in the tank when I was on board, and certainly it was always the first to come to the top for the chance of a crab or a bit of biscuit, and it rubbed its head and shoulders against my hand quite lovingly."—P. 59.

The tameness of fish is by no means unprecedented: I have been told of carp on the Continent, especially at Heidelberg, that come to the surface of the water to be patted by visitors; others collect at the tinkling of a bell, and others again obey the summons of a whistle. Fishes in the Brighton Aquarium come in crowds to touch Mr. Lawler's hands, which he dabbles in the water purposely to attract them, and I have seen a school of the beautiful rock whiting obey the beckoning finger of a visitor, who was evidently accustomed thus to exhibit his attractive powers. The truth is that fishes are greedy creatures, and in confinement soon learn that the visits of human beings are accompanied by food; hence, I conclude their love of man's society is what is usually denominated "cup-board love."

But we must not linger too long on the Færoe Banks: on the 9th Dr. Thomson steamed again to Stornaway, and thence, on the 15th, in a north-easterly direction, two hundred and fifty miles, dredging with various success. At Thorshavn, the capital of the Færoes, the naturalists were most hospitably entertained by Mr. Holten, the Danish Governor, to whose lady this splendid volume is dedicated, as a graceful acknowledgment, in these words:—"TO MADAME HOLTEN, THIS VOLUME IS DEDICATED, IN GRATEFUL REMEMBRANCE OF THE PLEASANT TIMES SPENT BY HIMSELF AND HIS COMRADES AT THE GOVERNOR'S HOUSE IN THORSHAVN, BY THE AUTHOR."

On the 21st of September, off Barra Head, the south point of the Hebrides, a fresh easterly wind blowing and the barometer low, Captain May did not think it desirable to stand to sea again. After consultation with Dr. Carpenter, he determined to conclude the work, steamed down the Sound of Mull, and anchored at Oban, when Dr. Carpenter and his son left the ship and journeyed southward by land. On the 24th Captain May started for Pembroke, and on the 25th, off the Calf of Man,—the barometer having suddenly fallen, and the wind and sea rising fast,—without increase of wind, and in a roll not heavier than usual, the whole of the weather fore rigging went, by the straightening or breaking of the hooks which held it. Fortunately the mast did not fall, and after an hour spent in effecting a temporary repair, the unlucky vessel proceeded on its course, and anchored in the new harbour of Holyhead at 6 p. m. on the same day, and so terminated the cruise of the 'Lightning.' The results were as satisfactory as the naturalists had ventured to anticipate, but the vessel was ill-suited to the service, and the weather most unpropitious. During the whole of the six weeks they were at sea, ten days only were available for dredging: on only four of these was the vessel in water over five hundred fathoms; nevertheless—

"It has been shown beyond question that animal life is varied and abundant, represented by all the invertebrate group, at depths in the ocean down to 650 fathoms at least, notwithstanding the extraordinary conditions to which animals are there exposed. It had been determined that, instead of the water of the sea beyond a certain depth, varying according to latitude, having a uniform temperature of 39° Fahr., an indraught of arctic water may have, at any depth beyond the influence of the direct rays of the sun, a temperature so low as 28° Fahr.: or, on the other hand, a warm current may have, at any moderate depth, a temperature of 44° Fahr.; and it has been shown that great masses of water at different temperatures are moving about each in its particular course, maintaining a remarkable system of oceanic circulation, and yet keeping so distinct from one another that an hour's sail may be sufficient to pass from the extreme of heat to the extreme of cold. Finally, it had been shown that a large proportion of the forms living at great depths in the sea belong to species hitherto unknown, and that thus a new field of boundless extent and great interest is opened to the naturalist. It had further been shown that many of these deep-sea animals are specifically identical with tertiary fossils hitherto believed to be extinct, while others associate themselves with and illustrate extinct groups of the fauna of

more remote periods; as, for example, the vitreous sponges illustrate and unriddle the ventriculites of the chalk."—P. 79.

These results were considered of sufficient importance to justify a second application to the Admiralty for assistance, and on the 18th of March, 1869, a communication was read to the Council of the Royal Society stating that the Lords Commissioners of the Admiralty had acceded to its wish for a second cruise, and that Her Majesty's survey-ship 'Porcupine' had been assigned for the dredging service.

Immediately on the receipt of this gratifying intelligence preparations were commenced, and under the direction of her able and courteous commander, Captain Calver, the 'Porcupine' was equipped for sea, Dr. Carpenter, assisted by a committee of the officers and a few members of the Royal Society, superintending all matters bearing on the efficiency of the scientific appliances. It was agreed among these competent advisers that the work should be divided into three cruises, the working of the dredge being superintended throughout by Captain Calver himself, to whose trained ability Dr. Thomson bears a warm and well-merited compliment, stating that he possessed so complete a mastery over the dredge that he found no difficulty in carrying it down to depths at which this kind of exploration would formerly have been deemed impossible. All the officers heartily and zealously seconded their commander in promoting alike the scientific objects of the expedition and the welfare and comfort of all who were engaged in carrying them out.

The first cruise covered a distance of four hundred and fifty miles along the Atlantic coasts of Ireland and Scotland, from Cape Clear to Rockall, including Lough Swilly, Lough Foyle and the North Channel to Belfast. The weather, the very reverse of what it had been in the 'Lightning' cruise, was remarkably fine, and it was found practicable to work the dredge during seven days at depths exceeding twelve hundred fathoms: the greatest depth achieved was in the North Atlantic, about half way between Achill and Rockall, fourteen hundred and seventy-six fathoms; and this dredging produced, together with various mollusks, a specimen of *Holothuria tremula* and a stalk-eyed crustacean with remarkably large eyes, besides an abundance of novel and interesting novelties in every division of marine Invertebrata. In the return passage

towards the North of Ireland the phosphorescence of the animals captured seems to have attracted particular attention.

“In some places nearly everything brought up seemed to emit light, and the mud itself was perfectly full of luminous sparks. The alcyonians, the brittle-stars, and some annelids were the most brilliant. The Pennatulæ, the Virgulariæ, and the Gorgoniæ shone with a lambent white light so bright that it showed quite distinctly the time by a watch; while the light from *Ophiacantha spinulosa* was of a brilliant green, coruscating from the centre of the disk, now along one arm, now along another, and sometimes vividly illuminating the whole outline of the starfish.”—P. 98.

From the 31st of July to the 11th of August, when she again steered northwards for Stornaway, the ‘Porcupine’ was detained by the necessity of coaling and of clearing out her boilers after being so long at sea; she then steamed slowly towards the Færoe Bank, continually dredging and making observations, the weather still continuing fine, and the appliances working admirably. Dr. Thomson tells us that an ingenious device of the Captain’s multiplied the captures a hundredfold.

“A number of tangles of teased-out hemp, like the swabs for cleaning the decks, were hung at the bottom of the dredge. These hempen tangles swept by the side of the dredge, pulling along and picking out everything which was moveable and rough. As echinoderms, crustaceans and sponges were very numerous in this cold area, the tangles often came up absolutely loaded, while there was but little within the dredge-bag.”—P. 105.

The following incident, which occurred on their second arrival at Thorshavn, will be read with pleasure :—

“From station 59 we proceeded northwards to Thorshavn, where we were warmly received by our kind friend Governor Holten, who had been forewarned of our visit, and at once came off in his barge to welcome us. Governor Holten was uncommonly proud of this barge, and he had some reason. She was a very handsome, trim boat, and manned by a dozen stout Færoese boatmen in their neat uniform; and, with the Danish ensign flying at the stern, and our handsome friend muffled in his military cloak with a thick hood to keep out the somewhat palpable and intrusive climate of Færoe, she looked all that could be desired. When the Governor came on board he proposed to Capt. Calver to try a race with him, for the honour of old England and the white ensign. Some of us were going ashore, and when the Governor came up from the cabin our whale-boat was lying alongside, with twelve blue-jacketed Shetlanders sitting like statues, their white

oars glittering in the sun. The Governor looked with the critical eye of a sailor at the two boats—he still spoke lovingly of the ‘Maid of Færoe,’ but I suppose he saw that, as Tennyson says, ‘we were all of us Danes,’ and the question of a trial of strength lapsed by mutual consent.”—P. 106.

The Færoes have become familiar to zoologists through the admirable papers of Captain Feilden in this journal: still there are objects of interest for every voyager who knows how to observe. Dr. Thomson expressly mentions Myling Head as one of these; it is a magnificent cliff at the north-western point of Stromoe, which falls perpendicularly into the sea from a height of more than two thousand feet. He adds that the tide runs among and round these islands like a mill-race, and Governor Holten told the voyagers that if they started with the morning flood, and the steamer kept pace with the tide, she might make the circuit of the island, passing under Myling Head, and returning to Thorshavn in six hours. Such an exploit was projected, but the weather proving boisterous, the experiment was not made, although everything had been arranged for it, and the ‘Porcupine’ left Thorshavn on the 24th of August, steaming east by south: the next soundings were off the Shetland plateau, and here—

“Among echinoderms *Ophiacantha spinulosa* was one of the prevailing forms, and we were greatly struck with the brilliancy of its phosphorescence. Some of these hauls were taken late in the evening, and the tangles were sprinkled over with stars of the most brilliant uranium green—*little* stars, for the phosphorescent light was much more vivid in the younger and smaller individuals. The light was not constant, nor continuous all over the star, but sometimes it struck out a line of fire all round the disk, flashing, or one might rather say glowing, up to the centre; then that would fade, and a defined patch, a centimetre or so in length, would break out in the middle of an arm, and travel slowly out to the point; or again the whole five rays would light up at the extremities and spread the fire inwards. Very young *Ophiacanthæ*, only lately rid of their *plutei*, shone very brightly. It is difficult to doubt that in a sea swarming with predaceous crustaceans, such as the active species of *Dorynchus* and *Munida*, with great bright eyes, phosphorescence must be a fatal gift. We had another gorgeous display of luminosity during this cruise. Coming down the Sound of Skye from Loch Torridon, on our return, we dredged in about a hundred fathoms, and the dredges came up tangled with the long pink stems of the singular sea-pen (*Pavonia quadrangularis*). Every one of these was embraced and strangled by the twining arms of *Asteronyx Loveni*,

and the round, soft bodies of these star-fishes hung from them like plump ripe fruit. The sea-pens were resplendent with a pale lilac phosphorescence, like the flame of cyanogen gas; not scintillating like the green light of *Ophiacantha*, but almost constant, sometimes flashing out at one point more brightly, and then dying gradually into comparative dimness, but always sufficiently bright to make every portion of a stem caught in the tangles or sticking to the ropes distinctly visible.”—P. 148.

This general illumination of ocean life seems hitherto to have been very much overlooked and wholly unexplained by voyagers; the “phosphorescence of the sea” has always been noticed, but it has been attributed to the presence of minute entomostracans, specimens of which have been fished up in buckets, and then fished out of the buckets to the great delectation of microscopists, who discovered that they were living animals; but here star-fishes and the larger invertebrates all exhibited this marvellous property.

Retracing her course towards Stornaway, the ‘Porcupine’ dredged in lat. $59^{\circ} 26'$ with a depth of seven hundred fathoms. The haul was not a rich one, but one of the captives, a contractile sea-urchin proved a great prize.

“As the dredge was coming in we obtained a glimpse of a large scarlet urchin in the bag. We thought it was one of the highly-coloured forms of *Echinus Flemingii*, of unusual size; and as it was blowing fresh, and there was some little difficulty in getting the dredge capsized, we gave little heed to what appeared an inevitable necessity, that it should be crushed to pieces. We were somewhat surprised, therefore, when it rolled out of the bag uninjured; and our surprise increased, and was certainly in my case mingled with a certain amount of nervousness, when it settled down in the form of a round red cake, and began to pant—a line of conduct, to say the least of it, very unusual in its rigid, undemonstrative order; yet there it was with all the ordinary characters of a sea urchin—its inter-ambulacral areas, and its ambulacral areas with three rows of tube feet, its spines, and five sharp blue teeth; and curious undulations were passing through its perfectly flexible, leather-like test. I had to summon up some resolution before taking the weird monster in my hand, and congratulating myself on the most interesting addition to my favourite family that has been made for many a day.”—P. 156.

I can readily imagine the nervousness of our author at witnessing this extraordinary spectacle. Of all animals in creation the sea-urchins appear most immovably fixed in their plate-armour. In previously described recent urchins this is invariably the case, but

in Calveria the plates, instead of meeting edge to edge and abutting against one another so as to form a continuous rigid shell, the outer portions of the interambulacral plates have spaces between them, which are filled up with membranes; and the inner margins of the plates form wide expansions which overlap. When, therefore, the enclosed animal, by a kind of rhythmical contraction and expansion, causes this overlapping of the plates, it would seem to pant, a proceeding sufficiently at variance with the ordinary course of nature to excite the nervous feelings of the boldest naturalist. It is an evidence of the author's good taste and good feeling that he has named this unexpected novelty after Captain Calver, thus dedicating this "wonder of the deep" to a commander whose name should ever be associated with an expedition to the success of which his knowledge, skill and unvarying courtesy so eminently contributed.

Two other genera of urchins, *Phormosoma* and *Echinotheria*, possess this seemingly anomalous structure, but neither of them has the external figure of an ordinary urchin so exactly as *Calveria*.

I must now take up my story at another point, and then bring it to a conclusion, for it is impossible to accompany these vessels through five hundred and thirty pages of sounding, dredging and discovery, or my review would be extended to a length quite prohibiting its insertion in the 'Zoologist.' The 'Porcupine' now steered southward on another cruise and at another date. On the 20th of July she dredged all day off the coast of Portugal at depths varying from 380 to 1000 fathoms; the results at 994 fathoms were so extraordinary as to excite the utmost astonishment of the dredgers, and are thus described:—

"It being late in the evening, the contents of the dredge could not be sifted and examined until daylight next morning. We then saw a marvellous assemblage of shells, mostly dead, but comprising certain species which we had always considered exclusively northern, and others which Mr. Jeffreys recognized as Sicilian tertiary fossils; while nearly forty per cent. of the entire number of species were undescribed, and some of them represented new genera. The following is an analysis of the Mollusca, perfect or fragmentary, taken at one haul:—Brachyopoda, 1; Conchifera, 50; Solenoconchia, 7; Gasteropoda, 113; Heteropoda, 1; and Pteropoda, 14; 186 species in all. Of these 91 were recognized as recent, 24 as fossil, and 71 were undescribed. * * * This remarkable collection, of which not

much more than one half were known to conchologists, notwithstanding their assiduous labours, teaches us how much remains to be done before we can assume that the record of Marine Zoology is complete. Let us compare the vast expanse of the sea-bed in the North Atlantic with that small fringe of the coast on both sides of it which has yet been partially explored, and consider, with reference to the dredging just mentioned, what are the prospects of our ever becoming acquainted with all the inhabitants of the deep throughout the globe. We believe, however, that a thorough examination of the newer Tertiaries would materially assist us in the inquiry, and such examination is feasible and comparatively easy."—P. 183.

The value and importance of these dredgings do not consist wholly, or even principally, in the number of species discovered or the novelty of their forms; they have a teaching higher than this—they correct and eradicate erroneous impressions, and show us how futile are the hypothetical limits assigned to oceanic life, and the boundaries affixed to the recent and fossil organisms of the sea: some of these speculations had so captivated and enthralled the credulous and superficial that they seemed to have attained the dignity of facts: without undervaluing in the least degree the additions made to our list of species, these rectifications, if I may so call them, are the greatest boon, and we cannot too heartily thank the men who have devoted their time, their energies, and their abilities, not only to the discovery of fact, but to that destruction of hypothesis which these facts involve.

The 'Depths of the Sea' will inevitably give an impetus to the reaction in favour of fact, and will discountenance that overweening love of speculation which has laid so many stumbling-blocks in the onward march of science and of truth. If the mind is occupied either in devising, accepting or refuting hypotheses, it is obvious it has little opportunity for acquiring, digesting and utilising fact. The work is not a mere evanescent production, to be laid aside as soon as read; its use will increase with the using; and however much we may prize it for ourselves, we may confidently anticipate that our children will hereafter prize it more; they will find the information it contains absolutely necessary to the just appreciation of that charming institution now happily becoming so general, the Marine Aquarium.

EDWARD NEWMAN.

The Sleep of Fishes. By W. R. HUGHES, Esq., F.L.S.

REFERRING to your notes (Zool. S. S. 3878), the following observations may be interesting at this time, as I do not remember to have seen anything similar recorded.

When at Tenby, in July, 1866, I was in the habit of visiting a certain rock-pool, by candle-light, late at night, usually between eleven and twelve o'clock, to see if the Actiniæ were expanded. The rock-pool in question is situated on the south-west side of St. Catherine's Rock, and is probably well known to collectors. It is a few feet up the rock, approached by rough natural steps, and the pool abruptly opens at right angles through a water-worn fissure in the rock, out of which the pool itself is scooped by the action of the sea. As far as I remember, it is about the size of an ordinary foot-pan. The water was of pellucid clearness, and at the time I mention the sides of the pool were studded with numbers of the lovely opaque white snowy anemone (*Sagartia nivea*), all fully expanded, and looking like daisies in early spring.

On one of my visits I noticed there were several small fishes at the bottom of this pool,—blennies and rocklings,—but I forget the number of each species. As every one who has attempted to catch these little fishes is perfectly aware, very few surpass them in their successful efforts at concealment. If one is found in a pool no bigger than a soup-plate, and there are only three or four stones in it, Master Blenny is sure to wriggle himself under them, or if there is but one crevice he is sure to ensconce himself in it. And his friend the rockling is equally artful in his proceedings. Imagine, therefore, my astonishment, on the occasion I mention, when by the light of the candle I saw these little fishes perfectly still at the bottom of the pool,—not darting off to find a corner, as they would in the daylight, nor appearing to notice me in any way. I pulled up my sleeve, and putting my hand quietly to the bottom took the whole of the fishes, one by one, and held them softly in the other hand. They neither moved nor showed any signs of resistance, nor attempted to escape, but seemed either asleep or temporarily paralyzed by the light, just as some birds are "scared" by the sudden appearance of a lantern, and may be captured without difficulty under the influence of the light. I returned them to the water, and they resumed their old places at

the bottom of the pool. I repeated the experiment several times during my stay, and always with the same results.

The observations that follow have been made on fishes in my own marine aquarium.

Regarding the wrasses, also mentioned in your notes above referred to, I have three in my aquarium at the present time,—of the species *Labrus maculatus*,—and in addition to the queer positions which you mention they assume during the night,—such as “some are on their sides, some seem to be jammed in the crevices of a rock, some seem to be standing on their noses, and some on their tails,”—I notice that they sometimes indulge in these singular attitudes during the day time, after they have been fed, just as some people take a nap after dinner! These attitudes are most extraordinary, and at first sight I thought the fishes were dead: the dorsal fin was rigid and motionless, and the fishes seemed, from their flabby, pallid appearance,—if I may use such an expression in reference to fishes,—to indicate, as in the higher vertebrates, a diminished power in the functions of circulation and respiration during repose. What is also remarkable, they usually select the *same spots to rest in*. No later than the 1st of this month, on which day I received your current number, I disturbed a wrasse from his place of retirement, and three times he resumed the identical position within a quarter of an hour!

The blennies usually select the same place to rest in at night, wedging themselves in a crevice, or more frequently lying on a piece of rock entirely out of water. So constant are they to these spots that I could direct a stranger where to find any particular individual at night in the tank.

The spotted gunnel or butter-fish (*Murænoides guttata*), although allied to the blennies, exhibits, as far as my observation of him in the aquarium goes, very few of the habits of that genus. For instance, he has none of that tameness and familiarity which characterize the blennies; neither is he so foud of raising himself on a rock above the water-mark as they are. I am inclined to think he is nocturnal; for during the day he remains partially coiled up round a weed or stone, and in the evening glides about with a very graceful snake-like motion and takes his food, striking at it just as a viper wounds an enemy.

The two-spotted sucker (*Lepidogaster bimaculatus*), a very old friend of mine, remains anchored by his ventral sucker,—with his

body curved, as my friend Mr. W. A. Lloyd remarks, to diminish the leverage,—in *one particular shell* (an old valve of a Cardium), and, although there are others in the tank, he never forsakes this for them, and if he is temporarily dislodged, waddles about with his peculiar tadpole-like progression until he finds his old quarters again.

The worm pipe-fish (*Syngnathus lumbriciformis*) is also rather attached to a particular locality, and may frequently be found under the same stone in the tank. When he does, however, condescend to take a swim and show that wonderful screw-propeller-like dorsal fin of his, what a beautiful object it is, strongly reminding one of the appearance of ciliary motion. It is a timid fish, and, like the Hippocampus, seems to have a somewhat plaintive expression of countenance.

The gray mullet, on the contrary, exhibit no such feelings of attachment: quiet and sedate during the day, with their noses sometimes out of the water, appearing to “nibble the air,” at night they are all activity, swimming round the tank after each other in delicate curves, the silvery scales of their abdomen flashing like drawn swords in the sunlight.

W. R. HUGHES.

Birmingham, 3rd February, 1874.

Postscript.—Closely bearing on, or connected with, the question as to the sleep of fishes, is another interesting subject, as to their torpidity in the winter months. During the severe frost which set in on the night of the 8th instant and continued until the 12th, the fishes in my aquaria remained in a lethargic state and refused food, or took it but very sparingly, although frequently offered. The wrasses assumed the same peculiar positions and conditions as mentioned above, the gray mullet lost their activity, and sought the bottom of the tank; even the blennies ceased to be familiar, and secreted themselves in crevices near their old spots. But immediately a change of temperature took place, on the 12th instant, followed by rain, all the fishes resumed their wonted activity, and took food freely.

Zoologists are much indebted to the Editor for bringing forward the interesting question as to the sleep of fishes; and it is to be hoped that, with the great facilities now afforded at the Crystal Palace, Brighton and other public Aquariums, this and other equally interesting problems in their life-histories will be solved.

13th February, 1874.

W. R. H.

Notes on the Birds of New Zealand.

By T. H. POTTS, Esq., F.L.S.*

(Continued from Zool. S. S. 3624.)

Kingfisher (*Halcyon vagans*, Gray).†—This valuable insectivorous bird, the “kotare” of the natives and the “kingfisher” of the settlers, is never molested here: it remains with us throughout the year, and in greater numbers than formerly; constant familiarity has enabled us to acquire further knowledge of the ways of the halcyon. Rather late in August, when the brown-skinned konini begins to deck its bare sprays with pendulous flowers, when the head of the straight-stemmed kowhai is already crowned with racemes of golden blossoms, *integratio amoris*, or rather the beginning of courtship, seems to occupy a share of the time which is not required to obtain the means of satisfying the cravings of the halcyon’s somewhat exacting appetite. Observation has rather led us to the belief that the female takes the initiative in these amorous advances. Whilst watching several birds which were busily engaged in snatching up and bearing off Crustacea from the sea-beach, in which employment the male birds displayed most activity, usually getting three or four crabs to one picked up by a female bird: a female would perch herself close to a male after one of his successful darts; all unmoved, he rapped his prey on his rocky stand and proceeded to gulp it down, apparently unconscious of the blandishments of the would-be charmer. Through the month of September we have noticed similar instances of insensibility or coyness on the part of the males, under circumstances when the females have had little chance of being favoured with some choice prey as a *gage d’amour*. Forwardness on the part of “the sex” is not without precedent; we have noticed that the nuptial plumage of the female spotted shag (*Phalacrocorax punctatus*) reaches its full development before that of the male; frequently one may observe the red plume-like stigmas of the hazel on the spray where the male catkins hang immature. During last season we knew of several nests that contained altogether nearly forty eggs. At each breeding-place that had been excavated in a bank or wall the

* From the ‘Transactions of the New Zealand Institute,’ vol. v., but kindly communicated by the author.

† See an extract about this bird in the ‘Zoologist’ for 1872 (S. S. 3087).

tunnel *invariably* inclined upwards, the entrance at some distance from the ground, four or five feet and upwards. In one instance the hole was not more than two feet from the base of a wall built on rather a steep slope; this is noted to show that the habits of our bird differ from those of its European congener *Alcedo ispida*. In Wood's 'Homes without Hands,' p. 519, is a representation of the nest of the English bird, and it may be noticed there that the floor of the tunnel is nearly on a level with the surface of the water; our bird always *ascends* in entering, and *descends* on quitting the nest.

October 10th, first egg laid in a nest on our cliff; second egg laid on the 12th, before 10 A.M.; third egg laid on the 14th; fourth egg on the 15th; fifth egg on the 16th; sixth and last egg, on the 17th. Subsequently the nesting-place was measured, and gave the following dimensions:—Entrance rather over two inches in diameter; tunnel sixteen inches in length; egg chamber of ovoid form, seven inches in length, five inches and a half in width, with a height from the bottom of four inches. The size of the nest may create surprise when one thinks of the space occupied by the eggs; but a roomy home is necessary, for, like those of most troglodytal breeders, the young remain in their hole till their wings are well grown. This stay-at-home habit saves the parents much expenditure of force, depending, as they do, for food on living prey; nor is the safety of their offspring so often jeopardised. Rapid digestion would cause the young to utter constant cries for food, which would disclose to enemies the whereabouts of each member of a scattered brood; the labour of hunting after stray young ones would be very great compared to the task of carrying food to one common feeding place. It should be noted that the egg-chamber is hollowed out slightly below the floor of the tunnel, a ridge is thus formed by which the eggs and newly-hatched young are kept safe from accident; in fact, there is no need of a nest during incubation, the warmth that is communicated to the hole by the body of the sitting bird being very considerable. The birds that built near us last season gave plenty of opportunity to watch their labours; steady hard work it is, indeed, that in some instances endures for weeks. After the site is selected and a commencement made, the birds do not both leave the spot, watch being kept by one whilst its mate works or is absent after food. Should an alarm be given it is speedily answered, though from the distance of half-a-mile.

Both take about an equal share of labour. On timing them it was found that if the female worked hardest one day, on the next the male was most laborious.

October 23rd. The female bird at work in the hole three minutes; the male then took his turn, the time in the tunnel for either bird varying from a few seconds to about three minutes. When the female flew off to feed, the male remained to watch just below the hole; after his mate returned, in about twenty minutes, he at once recommenced work. They darted upwards from their perches into the hole, always correctly judging the distance, at the moment of entering uttering a short cry of two notes like "chi-rit." They turned when in the tunnel, as they always emerged head first. Once the female darted to the hole and flew back, perhaps from timidity, more likely from coquetry, then sought the male, who bent down from his perch and caressed her with his bill. Early in the morning, from five to six o'clock, little work was done, that part of the day seeming to be the time allotted for feeding, but the state of the tide might have had something to do with this, as the greater part of their food is procured from the mud-flats at ebb tide.

A notable instance of their perseverance was given this season; a pair fixed for the site of their nesting-place the back of a plastered sod chimney attached to an empty cottage: they were at the chimney on the 19th of October. After commencing on the egg-chamber this nest was abandoned, probably the wall not affording what was considered by them a sufficient depth for the safety of their offspring. On the 3rd of November they were hard at work with a fresh nest in front of the cottage, between the door and a window; this was deserted for probably the same reason as caused them to leave the first nest. November 14th saw the same pair at work on a fresh site on the south wall of the same cottage, darting upwards from a convenient rail five and six times in a minute, till the hard plain surface of the wall was broken by the dig of the bill. This was the difficult commencement of their toil; here was no foothold, the beak served as a pick, and a separate dart upwards had to be made each time this pick was applied. Alas! their labour was again lost, three more holes were begun and partly completed in that wall; then this indefatigable pair went over to the opposite end of the cottage, and, in the chimney-wall they had first attacked, commenced another nesting-place,—this was the seventh attempt,—on November 26th. On December 4th

this contained two eggs; on the 7th five eggs. The nest was visited, always by the same person, on the 9th, 16th and 23rd; on the 25th there were five young ones, apparently hatched on the previous day, thus allowing seventeen days for incubation. From the state of the tunnel, the bird fed or was fed during incubation. When a fortnight old the young look very strange; they have a dim show of the colours of the old birds, but the feathers are in their sheaths over their whole bodies, so that they look prickly all over; irides dark brown, almost black; the bill black, with white tip to the upper mandible. On the twenty-fourth day the young left the nest, dashing out of the hole and covering quite two hundred yards before seeking a perch: this occurred on the 8th of January, so that most of the heavy labours of the birds, which commenced on or before the 19th of October, are now over, as the young are able to follow their parents to the feeding-ground. Here a very interesting question rises. In what state was the ovary of this female during the protracted labours of nest-building? What limit is there to the power of retention? as during a space of about six weeks, judging from the almost finished state of the nest, she was three times ready, or nearly ready, to deposit her eggs.

We found the halcyon scarce through some part of Westland, from Hokitika south to the Waio River; the note was only heard, or the bird seen, twice or thrice near the rivers Waitaroa and Okarita. Inland from the coast we have met with it as far back as Castle Hill, near Porter's Pass; this was at breeding time (December 6th). It is during this all important season that these, our silent birds, change their habit so much as to become really noisy; so many varying calls or cries are used that one accustomed to their society could tell of much they might be engaged in, even with his eyes shut. Their boldness in driving away intruders from their young is most conspicuous. The female bird will often meet a person some two or three hundred yards from her treasures, dash at the intruder, return to the place where the young are perched, and repeat the attack again and again. We have known it attack and drive back a dog; in the autumn, when the old birds are accompanied by their young, boldness seems mingled with mischief or humour. We have seen a group of five pigeons sunning themselves whilst preening their feathers on the roof of our village parsonage, in an instant scattered to the winds, as one might say, by the sudden dash of a mischievous kingfisher, with no other

apparent object than to excite their alarm. We have noticed sheep and cattle grazing close to a nest without causing any anxiety to the birds, yet a cat, or human being, would be immediately attacked. We have seen our handsome butterfly (*Pyrameis*) sunning itself unmolested just above a nesting-hole at which a pair of kingfishers were at work, yet after the young had flown we found the bottom of the chamber covered with remains of thousands of insects, including the gauzy wings of our largest dragonfly. At Ohinitahi, in the breeding-season of 1871, we knew of three nests containing in each seven eggs, one nest with six, and another with five eggs.

Thrush (*Keropia crassirostris*, *Gray*) ; “pio-pio” of the natives ; “thrush” of the settlers.—In writing on the natural history of our birds, the bewailment of their lessened numbers has come to be a matter of course ; the rapid settlement of the country has, in the case of the thrush, limited its range greatly, few birds having retreated with so much haste before the efforts of the cultivator. Let us take a section of this island, say one hundred miles in width, including Banks Peninsula, and stretching from the eastern to the western shore ; this will afford some information as to its present habitat. Within this range, at one time, the pio-pio might be found in any bushy place, not too far from water, where belts of shrubs afforded shelter and abundance of seeds ; ten years at least have passed since we heard of its occurrence in this neighbourhood (Governor Bay) ; on Banks Peninsula proper it is now scarce ; in the bush-dotted gullies of the Malvern Hills, the Thirteen-mile Bush, Alford Forest, and many other localities, it was not very uncommon ; now, let an enthusiastic naturalist traverse these places in quest of our feathered philosopher, he will find it has become a *rara avis* indeed. We must pass through these portals of the mountains, the river gorges, to catch sight of the thrush hopping about the openings of the bush, much after the fashion of its English namesake ; but even here its numbers have become wofully diminished ; four or five years ago, on either side of the Upper Rakaia, where the bushes descend the mountain slopes, these birds fairly teemed in their favourite haunts, but they are already becoming rare. They may be seen about the bushes that skirt the cold streams of the Havelock, the Upper Waimakariri and the Bealey ; through the romantic gorge of the Otira to the more level ground that stretches away to the Teremakau, it may be frequently seen, always appearing to prefer the timbered forests,

the mixed scrub, made up of moderate-sized bushes of *Coriaria*, *Olearia*, *Veronica* and *Coprosma*. As we reach the western coast, about the Arahura river, it was three years since most abundant. Last December we searched one of their former favourite haunts,—a large island in that river, more or less covered with scrub-bush, dotted with *Ti* trees,—and two or three specimens only were to be seen; they have been driven away from Arahura by the clearances for paddocks to supply the requirements of the West Coast cattle trade. Last December, in travelling along the coast from Ross to Okarita, we saw this bird in abundance on the face of those bluffs which form such picturesque breaks in that journey; up the river-flats it was equally numerous.

Settlers have given the name of “thrush” to the pio-pio, from its size and brown plumage recalling to mind their favourite of the old country: it possesses not in the slightest degree that charm of song which distinguishes the thrush, yet it enjoys the power of giving utterance to several pleasing notes. It does not stir so early as many other birds; its morning salute is a long-drawn, rather plaintive note; this peculiar whistle it indulges in at times only, for its habit, when close to the water frequently, is to pipe thrice, in a way that at once recalls the red-bill (*Hæmatopus*); the imitation is so like that the writer and his son (well acquainted with bird-notes and calls) were frequently deceived, and have looked for a red-bill till the pio-pio disclosed himself by fluttering from bush to bush. Its common song seems to be near akin to that of the lark (*Anthus Novæ-Zelandiæ*); it sounds two preludatory notes, then strikes off into a very brief song; when joyously flying in pursuit of the female it utters a quick “chi-chi-chit, chi-chi-chit;” it marks its displeasure, or tries to intimidate intruders that approach its nest with a low purring “churr-r-r;” both male and female join in this cry of anger. When singing, the effort is marked by the tail being spread, the wings held not quite close; the feathers of the breast and back are not raised, as in the case of the bell-bird. We have called this pio-pio a philosopher; he has quite as good a claim as many a biped to whom that title is accorded: who doubts this, let him make acquaintance with the pio-pio—not merely a sight acquaintance, but such an one as ripens into intimacy. The result will be to know a bird who takes the world as it is, indifferent as to food; that feeds on insects when procurable, or can make shift on grasses, seeds or fruits; that neither courts nor avoids observation;

is as bold as the robin or tit, without their intrusive friendliness; that, when in the presence of strangers, coolly pursues its occupation without the prying inquisitiveness of the brown creeper, or the watchful distrust of the popokatea; that defends his home with almost the courage of the falcon or tern. It seems to delight in those openings which are found in river-beds, between long belts of tutu and other scrub; there it may be observed either hopping along the ground or fluttering about the lower sprays of shrubs, flying out to the spits of sand, or drifted trees that lie stranded in the river-bed. On some of the longer-formed spits that are becoming clothed with vegetation, it searches amongst the burry (*Acæna*), snips off the fruit-stalks of moss, picking the seed of some trailing *Veronica*. Its progress on the ground is usually deliberate; it hops with both feet together, a slight flutter of the wings and a flirt of the tail accompanying each motion; when approached too closely it leaves its perch, always descending at first, as though safer when near or on the ground; if it would rise on the wing a momentum is gained by a succession of hops. In some of its habits one is reminded much of the wattle-bird; its usual associates, at any rate during the summer months, are tuis, parroquets and robins. Not much secretiveness is displayed in the choice of a site for its nest; it may be found at varying distances from the earth, from four feet to twelve and upwards, usually at seven or eight. The structure is firmly and compactly built, with small sprays for the foundation, on which moss is abundantly interwoven with pliant twigs; the lining is usually of fine grass bents; some nests are finished off with soft tree-fern down; it is usually placed in tutu (*Coriaria ruscifolia*), sometimes in *Coprosma* or manuka. From the neighbourhood of its home rivals of its own species as well as other birds are driven off. Probably it breeds twice in the season, although we have not observed more than two eggs to a nest; yet we have found four eggs tolerably forward in the ovary of a female killed at Christmas time: the full complement of eggs is probably four. The egg is of ovoid, sometimes elongated form, pure white, spotted with blackish brown or black, purplish at the edges of the spots; sometimes it is of a delicate pinkish tinge, just staining the white, spotted with brownish gray, with purplish blotches at the larger end. From a nest found at Arahura we have an egg that exactly resembles in its colour and markings that of *Oriolus galbula* of Europe: in size this specimen measures through the axis one

inch three and a half lines, with a diameter of eleven and a half lines.

December 26th, River Waio. In a nest about twelve feet from the ground, in a bush of *Coriaria*, the eggs (two in number) were of elongated form, and measured in length one inch seven lines by nearly one inch in width.

December 27th, River Waio. A nest in a small-leaved *Coprosma* (probably *rhamnoides*); female incubating a single egg; she remained on the nest till pushed off. The male bird was summoned by a jarring call, and both birds joined in a bold defence.

Near Lake Mapourika, in a very swampy situation, we found a nest with the walls very thickly built of moss and manuka sprays interwoven; it was placed about fifteen feet above the ground in a tall manuka. Dimensions of the nest across the top from outside to outside of wall about seven inches; diameter of cavity about three inches with a depth of two inches. We find this a fair average, after looking at scores of nests. The young when they emerge from the shell have a covering of dark down. We think the eye of the pio-pio gleams with much intelligence; perhaps this notion is conveyed by its narrow but bright pale yellow iris; the tongue is pointed, and furnished on the inferior side with a strong muscular process of almost horn-like consistence. Both skin and flesh are dark, but the flavour of the bird is not at all bad; it makes a savoury broil for those who bring the proper sauce—hunger; when not so provided, they do wanton mischief who kill a bird so harmless and interesting. They are very sociable, and a bush-hand living the life of a hermit, in his little whare of tree-fern stems up the Waio river-bed, fed some thrushes until he had enticed them to enter his hut. Once up the Havelock, in one of the outskirts of a mixed bush of *Phyllocladus*, *Fagus* and *Podocarpus*, several thrushes were observed flying from the top of a tree after insects, flycatcher fashion, in the glow of a hot afternoon. The writer inclines to the belief that the imitation of the redbill's note, above alluded to, is a good instance of the protective mimicry of sound. The pio-pio gets ample food, in the summer days at least, from the glades in the river-beds. Over these, high above, dash the falcons from amongst the rocky heights of the mountain chain; the hawk notes the movement of a bird below, but hearing the simulated cry of the redbill, withholds his dashing swoop, knowing that the wary

redbill will alarm his faithful mate, and that the pair, with forces combined, are not to be attacked with impunity:

(To be continued.)

Ornithological Notes from Torquay. By Baron A. von HÜGEL.

NOTWITHSTANDING the unusually mild weather we have been enjoying this winter, Torbay has been visited by a good many birds.

Black Ducks.—At present black ducks are very abundant, but so shy and wary that only very few are killed. They are mostly to be seen in large flocks,—I have counted over forty birds in one,—which are divided into several smaller ones, the whole group of birds often forming a semicircle. When alarmed black ducks do not rise in a body simultaneously, but each of the small flocks in succession; then, after wheeling about in a wild and irregular manner, rejoin into one large flock and resume their diving operations in some less disturbed portion of the bay. Single birds are very rarely seen, and I believe they are mostly wounded individuals. Most of the birds killed are shot on the wing, as one or other of the small flocks sometimes fly within gunshot of a sailing boat when wildly flying about after being frightened.

Scoters.—All the scoters I have seen belonged to the common species, *Oidemia nigra*, as I could not distinguish in any the characteristic white wing-band of the velvet scoter (*O. fusca*).

Gannet.—Gannets have not been very plentiful on our coast this winter; but on some days large numbers have entered the bay. About a fortnight ago a flock of several hundred birds were following a shoal of fish off Paignton, and the effect produced by the contrast of the lovely white of their plumage against the leaden sky and deep green sea was very striking. All the birds I have noticed were in adult plumage, and young birds seem to be at all seasons very rare on our coast: the only specimen I know of is a bird in the second year's plumage in the town museum.

Guillemots.—The guillemots, which are as usual abundant, are a regular puzzle to me, for they are to be found in all plumages from the dark summer to the light winter dress, and if anything birds with black heads—the supposed summer dress—are more numerous than those with the white. All the razorbills I have seen were,

with one exception, in full summer plumage. How can this be accounted for? I think by the white and black heads not being a seasonal change at all, but the sign of age. I remember being astonished last summer, whilst out shooting off Poole in July, by observing several guillemots in full winter dress. Some days ago I noticed a curious habit these birds have of *flying* through waves. I do not know if this habit has been noticed before, but it struck me at the time as curious. I was out sailing on a day when the south-east wind was sending some good-sized rollers into the bay, which made shooting almost impossible. Accordingly I employed my time in watching the birds around me, and whilst noticing the action of a small flock of guillemots two of the birds took wing, and, barely skimming over the water, flew through, and not over, the advancing waves, continuing their flight in this way for a considerable distance.

Skuas.—About a fortnight ago a small flock of skuas made its appearance in the bay. I noticed several of them chasing kittiwakes off Livermead. Judging by size, I think they must have been pomarines (*Lestris pomarinus*): this is the least rare of its kind, and visits our coast almost yearly during the cold season.

Manx Shearwater.—As usual, there are at present to be found about the bay a fair number of divers and a few grebes (*Podiceps cristatus*, *P. cornutus* and *P. minor*), with the common species of gulls, but no uncommon birds, with the exception of a Manx shearwater (*Puffinus Anglorum*) has been killed. The shearwater was shot on the 3rd of November last. These birds very rarely enter the bay, although very large flocks are said to be seen occasionally some distance out at sea.

The only land birds killed of late that I consider worth recording are the following:—

Firecrested Wren.—A male, Torquay, March 3rd, 1873.

Longeared Owl.—A pair, Torquay, December 17th, 1873. Mr. Shopland, the Torquay birdstuffer, informs me that both species of eared owls can only be considered as rare visitants to this neighbourhood.

Common Buzzard.—Examined, in the flesh, a fine female which had been trapped at Newton Abbot on the 10th of January.

Black Redstart.—Two adult males were killed in a garden in this town last month.

Roughlegged Buzzard.—One day, towards the end of December, —I forget the exact date,—I watched a large flock of hawks, which I conjectured to belong to this species. They were flying over this town, at no great height, in a south-easterly direction (cf. 'The Field,' January).

In the Torquay Museum there is a very fair local collection of birds, among which are the following specimens, which I think well worth recording, the more so as their occurrence has, in most cases, never yet been made known.

Hobby.—A very fine adult male, procured near this town in 1850. This is, as far as I can ascertain, the only *old* male of this species ever killed in the vicinity of Torquay.

Rosecoloured Pastor.—A pair; the female on Berry Head, June 12th, 1851 (cf. Burt, 'Zoologist,' 1851, p. 3233), and the male, a very fine bird, procured seven years later in the same place.

Eider Duck.—Female, Tor Bay, winter of 1866. A very rare visitant to our coast.

Eared Grebe.—An old bird in full summer plumage; shot off Paignton in May, 1853.

Horned Grebe.—A specimen in nearly full summer dress. A few young birds are yearly killed during the cold season, but old birds in summer plumage are extremely rare.

Great Northern Diver.—A good series, from winter to full summer plumage. The pair in summer plumage are the finest I have ever seen; they were shot in the bay by Mr. Rodway in May, 1864. Mr. Burt, curator to the Museum, informs me that these divers usually leave the coast by the middle of April, or even earlier; but that in 1864 a number of these returned at the end of May, all in full breeding dress, when the above-mentioned pair was killed.

Little Auk.—One picked up dead in Torquay Harbour in 1856.

Iceland Gull.—An immature bird, "shot in Tor Bay many years ago." A very rare winter visitant.

Glaucous Gull.—Several specimens: one adult, killed off Torquay in the winter of 1854. Young birds are rare, but regular winter visitants to this coast.

Ivory Gull.—A young bird, Tor Bay, January 18th, 1853 (cf. Burt, 'Zoologist,' 1853, p. 3807).

Pomarine Skua.—A beautiful adult bird, caught by hook and line in the bay many years ago. Young birds are procured every winter.

Cinereous Shearwater (*Puffinus cinereus*).—One caught in the bay in 1860. Several have since been procured, but it can only be regarded as a rare visitant.

A. VON HÜGEL.

Chelstone Cross, Torquay,
February 11, 1874.

Ornithological Notes from Devonshire, Cornwall, &c.

By JOHN GATCOMBE, Esq.

(Continued from S. S. 3829).

DECEMBER, 1873.

1st. There were several great northern divers in the Sound, and I observed some men chasing one in a boat, at which they had five shots, but I am glad to say did not kill it; many young herring gulls, however, fell to their guns. Shags are plentiful along the coast now; and this morning I saw one with a very large fish, which it had caught close to the rocks, and had great difficulty in swallowing. Large flocks of starlings were continually flying across the Sound from the east and going west.

3rd. Saw a fine old male black redstart on the cliffs near Bovisand, which had a very dark breast and conspicuous white patch on the wings.

5th. Approached within a few yards of a male ciril bunting perched on a bush, and which was singing as loudly as ever I heard one in spring. I mention this as there was a paragraph in the 'Zoologist' (S. S. 3772), by Mr. T. A. Briggs, on the autumnal song of the ciril bunting.

6th. There were several bartailed godwits in the Plymouth Market: this species is seldom observed in our neighbourhood after the autumn. This morning I observed a blackbird in the garden intently engaged in picking a bone which had been left by one of our dogs.

7th. Was much interested in watching a large northern diver washing and dressing its plumage on the water, about a hundred yards from the shore, every now and then throwing itself almost completely on its back during the process.

December 9th. Visited St. Germans. When concealed behind some trees in a wood close by the river, I managed with my telescope to have a most interesting peep at the gulls and waders on its banks. There were about two hundred of the *Larus ridibundus*, a great many curlews and a few redshanks feeding or resting together, almost within gunshot of me, with about a dozen herons fishing close by. The weather being exceedingly bright and still, with not a breath of air to ruffle the surface of the water, the form of every bird near its edge was reflected as if in a mirror, adding greatly to the beauty of the scene. After this I called on a wild-fowl shooter living in the town, who told me that for the last few nights, during the severe white frosts, the river was swarming with teal, and that the night before he had more than two hundred around his boat, but so scattered that he could not get more than two or three at a shot, and that they were almost every one of them males, which was generally the case at that time of the year: he also told me that there was a flock of full five hundred redshanks, which frequented the mud-banks, but that they were so wild he could not get within as many hundred yards of them.

13th. An immature black redstart was killed on the coast near Bovisand; this I examined and found to be a young male of the year.

14th. Three longeared owls and one shorteared have been killed in the neighbourhood, within the last few days, and sent to the birdstuffer for preservation. The longeared owl is very uncommon with us in Devonshire. I saw a fine old male shoveller, in the flesh, at a birdstuffer's, a few days ago. I also saw a very large northern diver, which had been caught in a fisherman's net; although it was very fat, yet there was nothing in its stomach but a few small stones. Small flocks of longtailed tits have made their appearance on the coast lately, so I think there must have been an arrival. The great blackbacked gull is now becoming more numerous; few visit us before Christmas.

28th. Observed an immature black redstart on the rocks at the Devil's Point, Stonehouse.

JANUARY, 1874.

On the 3rd there were above two hundred gulls and a large number of dunlins and ringed plovers on the mud-banks of the

Laira, with a party of eight dabchicks on the river, and immense flocks of lapwings and some golden plovers on the low flat grounds of the Plymouth race-course close by. Amongst some birds brought to a birdstuffer for preservation lately, I examined two ringed plovers in perfectly adult plumage, one being almost, if not quite, as large again as the other—capital illustrations of the supposed large and small races of this species. A few days ago I saw a great black-backed gull in that interesting state of plumage, apparently quite adult about the head, breast and back, but with the tail beautifully freckled or mottled with dark brown and white.

I have lately examined the stomachs of two more shorteared owls, each of which contained the perfect legs of a redwing and the remains of other birds.

On the 17th I observed a large number of curlews, lapwings and ringed plovers on the banks of the Tamar; also a few fieldfares in the neighbourhood, which latter were no doubt driven in from the hills of Dartmoor, at the time covered with snow. It had been blowing very hard up to the 20th, on which day many great blackbacked gulls made their appearance in our harbours.

On the 23rd I examined an old pied wagtail, which had as complete a black back as in spring, though perhaps a little duller in colour; the front of its head, cheeks and throat were, however, very white. I do not mean that the dark plumage of the back had been recently assumed, but it must have been produced at the last autumnal moult.

On the 27th I saw an old guillemot which was already assuming the breeding plumage, some dark feathers having appeared about the chin and throat.

29th. There was a moorhen in the market in beautiful plumage, with the naked skin on the forehead and base of the bill of the brightest blood-red or crimson; the garters on the legs, too, were of a very bright colour. Examined the stomach of a dipper, which contained nothing but the remains of insects and their larvæ, among which were several very small beetles with dark brown and yellow elytra.

Two or three years since I mentioned having seen a nest containing three young blackbirds perfectly white, belonging to a person in Plymouth, and a few days since one of these identical birds was brought to a birdstuffer to be mounted, having died only the day previously. Its head and neck were quite naked, and its

death, I hear, was caused by its not being able to get over its moult; the rest of its plumage was perfectly white.

JOHN GATCOMBE.

8, Lower Durnford Street, Stonehouse, Plymouth,
February 6, 1874.

Correction of Error.—In my notes for September (Zool. S. S. 3785, fifth line), in speaking of the hen harrier, for "a bird very numerous with us of late years," read "a bird very scarce with us," &c.—J. G.

Ornithological Notes from Lancashire (continued from Zool. S. S. 3801).—

Bartailed Godwit.—Sept. 20, 1873. A male bird of the year shot to-day had not yet assumed its winter plumage, having the buff-coloured breast peculiar to young birds. Its stomach contained sand, small angular pieces of gravel and fragments of small mollusks.

Sanderling.—Sept. 27. One shot on the Formby shore to-day, in full winter plumage.

Gray Plover.—Sept. 27. Four birds of the year shot to-day on the flats still contained slightly buff-coloured breasts. There are now enormous flocks at the mouth of the Mersey: they do not associate with other waders, though occasionally a straggler is seen with a party of dunlins. Nov. 1.—Some observed to-day in full winter plumage.

Dunlin.—Oct. 1. Enormous flocks on the mud-flats. Nov. 1.—This afternoon I shot a female, which had not quite completed its autumnal moult, a few chestnut feathers being still left on its back and wings, which have a very pretty effect against its sober winter dress, and a few black feathers still remain on its breast.

Iceland Gull.—Nov. 8. This afternoon, whilst out with a friend, picked up a winged immature bird on the Formby shore; the wound was recent, but as the bone was only broken at the carpal joint we carried it home alive, and it is now quite strong and well. It feeds quite greedily on fish, refuse, and indeed scraps of any kind, frequently shaking its food in a pan of water before swallowing it.

Heron.—Nov. 17. The stomach of a female I examined to-day contained three frogs in various stages of decomposition, one nearly perfect.

Leach's Petrel.—An adult specimen was shot at the end of November or beginning of December near Southport.

Tawny Owl.—Dec. 8. The stomach of a bird examined to-day contained the remains of a blackbird.

Linnet.—Nov. 8. I saw at the bird-market, Liverpool, to-day, a linnet whose whole head, beak and neck were white. It had about an even number

of white and brown feathers on its back and stomach; wings and tail of the usual colour.

Errata.—In my last notes (Zool. S. S. 3798 and 3800 respectively), for Eastern Broad read Easton Broad, and for Barnsbury Common read Bransbury Common.—H. Durnford; Stanley Road, Waterloo, Liverpool, January 3, 1874.

Ornithological Notes from Denbighshire.—

Ruff.—In August I received a bird of this species from Rhyl. There was another with it at the time. The gentleman who shot it informed me that he had also observed several turnstones about.

Crossbill.—For the last three months a large flock of these birds has been frequenting a wood near here, where they are invariably to be found feeding on the cones of the larch.

Snow Bunting.—On the 24th of December I shot one of these birds, a male, in fine plumage; oddly enough, it is the first specimen that has come under my notice in this country.

Longeared Owl.—One shot by a gentleman here during December.

Greater Spotted Woodpecker.—I saw a bird of this species on the 20th of December. It is not uncommon about here in the winter, but does not, I think, breed with us.

Siskin.—These interesting little birds have visited us this year in somewhat unusual numbers.

Mountain Finch.—Large flocks distributed over all the high stubble-lands.

Golden Plover.—Large flocks on the moor.—W. J. Kerr; Maesmor, Corwen, Denbighshire, North Wales.

Plumage of the Black Redstart.—Having read Mr. Clogg's interesting note on the black redstart (S. S. 3832), may I be allowed to add a few remarks on the plumage of that species. I do not think that ornithologists are generally aware that the winter plumage of the fully-adult male black redstart really varies but little from that of summer; the only difference is that in winter the feathers of the body, being longer and more or less tipped with gray or brownish gray, give to the general plumage a duller cast, but these tips becoming abraded or worn off towards the summer (as in the case of many other small birds) leave the under plumage, of course, more pure and distinct. Nevertheless I have seen a few splendid old males, at different times throughout the winter, with almost pure black breasts and a large white patch on the wings. Indeed the white on the wings is then even more conspicuous than in the breeding season, for by that time the edges of the feathers have become comparatively short or much abraded. The black redstart is a regular winter visitor to the coasts of Devon and Cornwall, arriving generally at the beginning of November and leaving by the end of March or beginning of April, and the reason that so few black-breasted

specimens are seen is because the great majority which visit our coasts are young birds of the year in their plain brownish gray dress.—*J. Gatcombe.*

Dartford Warbler in Suffolk.—Mr. G. T. Rope, in the last number of the 'Zoologist' (S. S. 3865), in announcing that an example of the above species had been picked up dead at Leiston, asks if this is not a new locality for it, as Yarrell makes no mention of its occurrence in Suffolk. I am aware of but one other Suffolk specimen, which was shot by my late friend Mr. Thomas Dix, on Nacton Heath, near Ipswich, and is still preserved in his collection, with others from the South of England.—*Henry Stevenson; Norwich, February 17, 1874.*

On the Occurrence of *Emberiza nivalis* in full Summer Plumage.—I have long been under the impression that the snow bunting breeds in some of the more unfrequented northern parts of the United Kingdom, and I trust that by next autumn I shall be enabled to thoroughly establish that fact. I have met with *Emberiza nivalis* early in September in Suffolk and Norfolk, and on more than one occasion have observed it in Galloway, in the south-west of Scotland, during July and August. In Orkney I have seen it in pairs at the beginning of August; and from what I have been enabled to learn from the country people there is no doubt but that it breeds in those islands, though I have as yet been unsuccessful in procuring the nest or eggs. I have seen evidently quite young birds about the 2nd of August near Stromness, and undoubtedly bred in Orkney. What I wish to record, however, is the occurrence, early in July of 1872, of a specimen of *Emberiza nivalis* in full breeding plumage at Eastbourne, in Sussex. I only knew of this last week, and I believe it to have been unrecorded in any Natural-History periodical. I believe it was shot upon the 2nd of July, but my informant, on whose word I place perfect reliance, is not certain of the exact date. It was shot upon the sea-beach opposite the Cavendish Hotel, and taken by the person who killed it to Bates, the taxidermist, of Eastbourne, who sold the skin to a gentleman living in Huntingdon, but whose name he could not remember. It is rather late in the day to record the occurrence of a bird of 1872; but this fact tends to assist my belief that this species does occur in the British Islands in summer more often than is generally believed to be the case, and ere long I think it will be proved that it breeds with us.—*Alexander W. M. Clark-Kennedy; Guards' Club, S.W., January 15, 1874.*

Buff Variety of the House Sparrow.—A curious variety of the house sparrow was shot in Cambridgeshire last week, and is now in my possession. Its colour is a uniform light buff; the back and wings dark buff, with light brown edgings to the flight feathers.—*Walter T. Ogilvy; British Museum, February 16, 1874.*

Siskins breeding in Ireland.—I am unable to find recorded any actual instance of the siskin breeding in Ireland. Thompson, indeed, in his

'Natural History of Ireland,' says, "That they may occasionally even breed in some parts of the County of Wicklow, and certain suitable localities in the North, is not improbable;" but this is only a surmise, and seems not to have been based on any actual observation. I am happy to be able to state that this surmise of Thompson's is correct. In May, 1871, a pair of siskins reared a nest of young ones in our pleasure-ground. The nest was placed about twenty-five feet from the ground, near the extremity of a long branch of a tall larch tree. It could not have been reached without cutting the branch. However, I had no intention of meddling with it; but, being an invalid at the time, I watched with great pleasure, from a sofa purposely placed close to the tree, the feeding of the young and the habits of the old birds. On referring to my note-book, I find that on the 22nd of July, 1866, I saw either a female or young siskin close to the house: I presume, therefore, that a brood was reared in that year also. I may add that the siskin visits us almost every winter in greater or lesser numbers, feeding, as is their custom, almost exclusively on the alder, and generally in company with their friends the redpolls. I find that when caged the siskin becomes instantly "at home," feeding and twittering at once as if at full liberty.—*Richard M. Barrington; Fassaroe, Bray, County Wicklow, Feb. 1, 1874.*

PS.—I have not seen the number of Professor Newton's new edition of Yarrell which contains the siskin.—*R. M. B.*

White Woodcock in Ireland.—I saw a beautiful white woodcock a few days since in Dublin: it had been killed in the South of Ireland.—*Rev. E. Robinson, in a letter to Mr. Gatcombe.*

Ferocity of the Jackdaw.—In the January number of the 'Zoologist' (S. S. 3828) I see a note on the ferocity of the jackdaw. A very similar instance came under my observation during the past summer. When out driving one day in June I noticed, about fifty yards in front of the horse, a thrush, apparently just out of the nest, in the middle of the road. While I was looking at it a jackdaw suddenly flew over the fence, and, regardless of the cries of the infuriated parent, carried off the hapless youngster to an adjoining tree, where he immediately devoured it.—*W. J. Kerr.*

The Mute Swan and its Food.—The well-known and majestic mute swan was formerly somewhat common upon several parts of the Avon, where it annually bred, and was, in a measure, but semi-domesticated, and often have I watched the fierce struggles which took place between them at the pairing season, and afterwards the watchful and sentinel-like sailing to and fro of the male to protect the nest and his sitting mate from molestation, and eventually the advent of the four or five (on one occasion I counted seven) parti-coloured nestlings, who for nearly a year bore marks of their immature state. All this and much more I well remember, even the schoolboy achievement of getting to the nest through mud and water up to one's neck, and finding the huge dirty looking eggs amongst a profusion of down, which

performance was gone through at the peril of the old birds, or worse still the old fisherman "coming down" upon us. A few years ago nearly all the old swans were caught or killed; and I have been informed that the reason for so doing was that they lived almost entirely upon the ova and fry of various fishes—salmon and trout to wit. We well know how readily an accusation of this kind receives support, especially from those who have an interest in the matter; for instance, the little dipper—whether rightfully or wrongfully I am not prepared to say, as it does not inhabit this part—is accused of being one of the worst depredators of the trout-streams in the more northern counties; but as an amateur lover of the feathered tribes I am somewhat sceptical as to the swan's "almost entirely" living at the expense of the piscine race. I have many times seen them feeding upon the water-weed (*Anacharis alsinastrium*), and have been somewhat amused at their grotesque attitudes, when the long flexible stems of this aquatic plant hung about their neck and seemed much to annoy them, but all of which were eventually disposed of down the swan's capacious gullet. Possibly they sometimes destroy the spawn of various fishes, but, as far as I have been able to observe, they do not destroy the young fry, or at least make a practice of doing so, but make the above-named and other weeds their staple food. I never on any occasion saw a swan feeding which gave such an "ocular demonstration" of their powers of destruction to the angler's favourites as is sometimes observed in the habits of its distant but long-necked relation, the common heron, whose grip of an eel must be anything but comfortable to the captured fish, if we may judge by its writhings and contortions when held in the unmerciful beak of its captor.—*G. B. Corbin; Ringwood, Hants.*

Ostriches pairing.—An editorial note (Zool. S. S. 3531) expresses a wish for some information from the Cape on this point. In consequence, Mr. F. Denny, of Graham's Town, has, at my request, made inquiries amongst the hunters and ostrich farmers, and learns from them that in domestication the birds are paired as strictly as possible, but in a wild state the strongest male collects as many wives as he likes, leaving the weaker ones to find mates as they best can. The female, after laying her eggs, turns out of the nest all she cannot cover and keep warm, and at night the male relieves her on the nest, seeking his own food by day. As he could not do this in the natural state, many more eggs must be addled than on the farms, where they can be removed to other nests. The theory that these eggs are designedly left out of the nest by the parent bird in order to provide food for the chicks, is laughed at there; but how do they procure sustenance, nesting as they do in the desert, long distances away from any vegetation? As the feathers have to be cut off the live birds, they are not worth so much as those plucked from the wild ones after death.—*H. F. Bailey; November 13, 1873.*

Ostrich Economy.—A new industry is likely to spring up in cultivating the ostrich. A French officer in Algeria, having discovered that some ostrich eggs which were accidentally left in a hole in the wall of a bake-house were, in course of time, hatched by the gentle and continuous heat to which they were exposed, conceived the idea of, first, keeping ostriches in confinement, and, secondly, hatching the eggs in artificial incubators and rearing the “chicks” thus hatched. For several years he assiduously carried his idea into practice; and, after repeated experiments, has succeeded in discovering all the secret details of the domestic economy of the ostrich. Instead of the cold-hearted parent “travellers’ tales” have led us to suppose the ostrich to be, it seems, if the narrative to which we have referred be trustworthy, to be a most exemplary parent. Its nest certainly is made simply by scooping a large hole out in the sand, but over that nest it watches with unceasing devotion. Not only the hen but the male bird takes part in the incubation, thus setting an example which puts our domesticated fowl to shame. The breeding season commences in February or March, and for a whole month the hen bird continues laying—producing an egg about every other day: these are carefully watched, moved about every day, and as they increase in number the “sitting” becomes more and more close. About eighteen eggs are laid on an average, but all of these are seldom hatched; two or three are invariably placed outside the nest, for a purpose which we will explain presently. About fifty-three days is the natural period of incubation, and the cock and hen take their turns with unfailing regularity on the nest. Sometimes Mr. Ostrich imitates Brigham Young’s example, and has several wives. When this is the case, he takes charge of the nest by night, and during the day, while he takes a stroll with some of his wives, one at least remains with the eggs. The nest is frequently made miles away from a blade of grass, and daily excursions are necessary in search of food; and here is the explanation of the ejected eggs; the baby ostrich would be unable to travel so far on his first entry into the world, and these eggs are left to be broken by the mother for his sustenance during the first few days of his life. The shell being cracked by her powerful beak, the new-born ostrich eats the yolk as it runs on to the sand, frequently consuming large quantities of sand too. The hard substances, such as pebbles, iron nails, &c., which have been found in the gizzards of ostriches, are swallowed for the purpose of assisting digestion; the grinding process which takes place is common to all birds. It is said that in Italy the knowledge of this fact is turned to account by lapidaries, who make turkeys swallow gems that they may be subjected to the process for a time, and thus receive the appearance of old stones. What a saving of time would be effected by using an ostrich for this purpose!

Proceedings of Scientific Societies.

LINNEAN SOCIETY OF LONDON.

January 15, 1874.—GEORGE BENTHAM, Esq., F.R.S., President, in the chair.

Dr. Hooker exhibited a very beautiful series of specimens of fossil copal, the product of *Trachylobium Hornemannianum*, some specimens of recent copal from the same plant, and some fruits of a *Momordica*, all forwarded from Zanzibar by Dr. Kirk, for the Kew Museum.

A framed plate of coloured drawings of edible and poisonous British Fungi, presented to the Society by Mr. Thomas Walker, was exhibited.

The following papers were then read:—

1. "On some Species of Japanese Marine Shells and Fishes which inhabit also the North Atlantic." By Mr. J. Gwyn Jeffreys. The Mollusca noticed by the author were procured by Capt. St. John in H.M.S. 'Sylvia,' during the years 1871 and 1872, on the coasts of North Japan. His dredgings varied between three and one hundred fathoms. After passing in review the works of naturalists who had described the marine shells of Japan, and especially the 'Mollusca Japonica' of Dr. Lischke, with reference to those species which are common to Japan and Europe, Mr. Jeffreys proposed to record from Capt. St. John's dredgings thirty-nine species, and to give the range of depth for such of them as he had obtained in the 'Porcupine' expeditions of 1869 and 1870. He then offered an explanation of the occurrence of the same species in the Atlantic and Pacific Oceans, by suggesting that it was probably owing to involuntary transport by tides and currents, and not to voluntary migration. Very little is known about the direction and force of deep-sea currents; but high northern species might be transported on the one side to Japan and on the other to Europe by a bifurcation of the great Arctic current, which has been traced as far south as the Straits of Gibraltar in the course of the 'Porcupine' expeditions. The entry of northern species into the Mediterranean may be accounted for by the former existence of a wide channel, or rather an open sea between the lower part of the Bay of Biscay and the Gulf of Lyons, which has been satisfactorily proved on geological grounds to have been formed since the Tertiary epoch. A list of the Mollusca referred to in the paper was given, with critical remarks, as well as a list of twenty-two species of fish which Dr. Günther communicated as common to the Japanese Seas and the North Atlantic or Mediterranean.

After the reading of the paper, Captain St. John was called on by the President, and stated that he hoped in future cruises to be able

to obtain further results, and to visit the warm as well as the cold streams.

Dr. Carpenter made some general remarks on ocean-currents, especially with reference to the zones of temperature in the North and South Atlantic. He stated that it has been ascertained that water of 40° F. comes nearer to the surface in the equatorial regions than in the north and south temperate zones. There are, he believes, zones of all temperatures in all deep seas, such as that of 33° F. observed by Capt. St. John between Socotra and the Seychelles. He hoped that Capt. St. John would in his future expeditions be able to obtain a very valuable series of observations of deep-sea temperatures.

Dr. Allman bore testimony to the great importance of the results obtained by Capt. St. John, and referred to a magnificent collection of Hydroids brought home by him, a description of which Dr. Allman hoped on a future occasion to be able to lay before the Society. The specimens all belonged to types hitherto considered extinct; and he entered into some description of one of the most remarkable forms.

2. "Notes on Japanese Brachiopoda." By Mr. Thomas Davidson. Communicated by Mr. J. Gwyn Jeffreys.

ZOOLOGICAL SOCIETY OF LONDON.

January 6, 1874. — Dr. A. GÜNTHER, F.R.S., Vice-President, in the chair.

The Secretary read a Report on the additions that had been made to the Society's Menagerie during the month of December, 1873, and called special attention to a female onager, or wild ass, presented to the Society by Capt. Henry Lowther Nutt, and a pair of the new Japanese storks (*Ciconia Boyciana*), brought home by Mr. R. Swinhoe, and presented to the Society by Mr. R. H. Boyce. The Secretary also called the attention of the meeting to a pair of the spotted wild cat (*Felis torquata* of Jerdon), which had been presented to the Society by Capt. J. J. Bradshaw, who had taken them as kittens in the Scinde Valley, Cashmere.

Dr. A. Leith Adams exhibited and made remarks on the horns of a feral race of *Capra Hircus*, from the Old Head of Kinsale. The horns were very remarkable for their large size and very close resemblance to those of *Capra ægagrus*.

Mr. P. L. Sclater read a synopsis on the species of the genus *Synallaxis*, of the family *Deudrocolaptidæ*. The specimens of this difficult group in nearly all the principal collections of Europe and America had been examined, and the existence of fifty-eight species ascertained, besides three of which the types were not accessible, and which were considered to be doubtful.

Mr. George Busk read a paper on a new British Polyzoon, proposed to be called *Hippuria Egertoni*, after Sir Philip Egerton, who had discovered it growing upon the carapace of a specimen of *Gonoplax angulatus*, dredged up at Berehaven in the course of last summer.

Mr. Alfred Sanders read a series of notes on the myology of *Phrynosoma coronatum*.

A communication was read from Dr. Gray containing a description of the steppe-cat of Bokhara, which he proposed to designate *Chaus caudatus*.

Sir Victor Brooke, Bart., read a paper on Selater's Muntjac and other species of the genus *Cervulus*. In pointing out the distinctions which characterize the three existing species, *Cervulus Muntjac*, *C. Selateri* and *C. Reevesii*, the author showed *C. Selateri*, the species of most northern range, to be intermediate in specific characters and size between the two others. Sir Victor pointed out an advance in the specialization of the tarsus of *Cervulus* not hitherto observed. In this genus the navicular, cuboid and second and third cuneiform bones were anchylosed together and formed one single bone, the first cuneiform being represented by a very small and separate bone.

A second paper by Sir Victor Brooke contained the description of a new species of deer from Persia, a pair of horns of which he had received from Major Jones, H.B.M. Consul at Tabreez in Persia, and which he proposed to call *Cervus mesopotamicus*.

Major H. H. Godwin Austin read a paper on some birds obtained by him in 1872-73 along the main water shed of the Brahmaputra and Irrawaddy rivers. Of these ten were considered as new to Science, *viz.*:—*Sitta nagensis*, *Garrulax galbanus*, *G. albosuperciliaris*, *Trochalopteron cineraceum*, *T. virgatum*, *Actinodura Waldeni*, *Layardia rubiginosa*, *Prinia rufula*, *Cisticola manipurensis*, *Munia subundulata*.

Mr. Garrod made some remarks upon the morbid symptoms presented by the Indian rhinoceros that had lately died in the Society's Gardens, and upon certain points in its anatomy.

Mr. Edwyn C. Reed communicated a paper on the Chilian species of the Coleopterous families Cicindelidæ and Carabidæ.

January 20, 1874.—Professor NEWTON, Vice-President, in the chair.

Mr. Selater exhibited two skulls of Baird's tapir (*Tapirus Bairdi*) received from Mr. Constantine Rickards, of Oaxaca, Mexico. The receipt of these specimens proved that this tapir extended from Panama through Central America into Southern Mexico, and was probably the only species of this genus to be met with in America, north of the Panamanic Isthmus.

Mr. Selater also exhibited and made remarks on skulls of *Ovis arkar*, from the Altai Mountains, and the stuffed skin of a specimen of the wild ibex of Crete.

Mr. E. Ward exhibited two feet of a fawn, the mother of which had double hind feet, and had for several years brought forth fawns having the same malformation.

A communication was read from Dr. O. Finsch containing the description of an apparently new species of parrot from Western Peru, which was proposed to be called *Psittacula andicola*.

A second paper by Dr. Finsch contained the description of a new species of fruit pigeon from the Pacific Island of Rapa or Opara. This unique specimen had been sent to the author by Mr. F. W. Hutton, of Otago, New Zealand, after whom it was proposed to name the bird *Ptilonopus Huttoni*.

A note was read by Major St. John on the locality of the Beatrix antelope (*Oryx Beatrix*), which was believed to be the south of Muscat.

Mr. Edward R. Alston read the description of a new bat of the genus *Pteropus*, which had been sent to him from Samoa for identification by the Rev. S. J. Whitmee. Mr. Alston proposed to call this species *Pteropus Whitmeei*.

A communication was read from Mr. A. G. Butler, containing a list of the species of *Fulgora*, with descriptions of three new species in the collection of the British Museum.

A communication was read from Mr. Herbert Druce, containing an account of the Lepidopterous insects collected by Mr. E. Layard, at Chentaboon and Mahconchaisee, Siam, with descriptions of new species.

February 3, 1874.—Dr. E. HAMILTON, Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of January, 1874, amongst which were specially noticed a female water-deer (*Hydropotes inermis*), a pair of pinkheaded ducks (*Anas caryophyllacea*), and a dusky monkey (*Semnopithecus obscurus*), acquired by purchase, and two vulturine Guinea-fowls (*Numida vulturina*), presented by Dr. J. Kirk.

An extract was read from a letter addressed to the Secretary by Mr. Luigi M. L. Albertis, containing an account of a new species of kangaroo, of which he had lately obtained a living specimen from New Guinea, and which he had proposed to call *Halmaturus luctuosus*.

Dr. Cobbold communicated the second part of a series of papers entitled "Notes on the Entozoa;" being observations based on the examination of rare or otherwise valuable specimens contributed at intervals by Messrs. Charles Darwin, Robert Swinhoe, Charles W. Devis, the late Dr. W. C. Pechey, Dr. Murie, and others.

Mr. Garrod read a paper in which he proposed a new classification of birds, founded mainly on the disposition of their muscles and other soft parts. The five muscles which he had observed to vary most were the ambiens, the femora-caudal, the accessory femora-caudal, the semi-tendinosus.

and the accessory semi-tendinosus. After stating which of these are present or absent in the different families of birds, he showed that the presence or absence of the ambiens muscle is so intimately correlated with other characters that a division of the whole class into Homalagonati and Anomalagonati, depending on that peculiarity, would stand the test of much criticism. The Homalagonatous birds were divided into the Galliformes, the Anseriformes, the Ciconiiformes and the Charadriiformes; the Anomalagonatous into the Passeriformes, the Piciformes and the Cypseliformes. Among the most important changes proposed or substantiated were the placing *Serpentarius* and *Cariama* with the Otididæ, the Cypselidæ with the Trochilidæ, and the Musophagidæ among the Galliformes.

ENTOMOLOGICAL SOCIETY OF LONDON.

January 26, 1874.—Prof. WESTWOOD, M.A., F.L.S., President, in the chair.

An Abstract of the Treasurer's Accounts for 1873 was read by Mr. Jenner Weir, one of the Auditors, showing a Balance of £150 10s. 3d. in favour of the Society.

The Secretary read the Report of the Council for 1873.

The following gentlemen were elected Members of Council for 1874:—Sir Sidney Smith Saunders, Messrs. W. C. Boyd, Dunning, Grut, Meldola, Moore, M'Lachlan, F. Smith, Stainton, Stevens, Verrall, Jenner Weir and Professor Westwood.

The following officers were subsequently elected, *viz.*:—Sir Sidney Smith Saunders, President; Mr. M'Lachlan, Treasurer; Messrs. Grut and Verrall, Secretaries; and Mr. Janson, Librarian.

The President then read an Address on the progress of Entomology during the past year.

February 2, 1874.—J. W. DUNNING, Esq., F.L.S., Vice-President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—‘Proceedings of the Royal Society,’ No. 148; presented by the Society. ‘Proceedings of the Scientific Meetings of the Zoological Society of London for the Year 1873,’ parts i. and ii.; by the Society. ‘*Horæ Societatis Entomologicæ Rossicæ*,’ tome ix. nos. 3 and 4; tome x. no. 1; by the Society. ‘The Journal of the Quekett Microscopical Club,’ No. 25; by the Club. ‘L’Abeille, 1874,’ livr. 2, 3 and 4; by the Editor. ‘Appendice aux troisièmes additions au Synopsis des Gomphines;’ ‘Appendice aux troisièmes additions au Synopsis des Calóptérygiens;’ by the Author,

M. Edm. de Selys-Longchamps. 'Monograph of the Collembola and Thysanura,' by Sir John Lubbock, Bart., &c.: 'Endomycici Recitati: a Catalogue of the Coleopterous Group Endomycici, with Descriptions of New Species, and Notes,' by Henry Stephen Gorham; by J. W. Dunning, Esq. 'Les Métamorphoses des Insectes,' par Maurice Girard; by the Author. 'Enumeratio Hemipterorum: Bidrag till en förteckning öfver aller hittills Kända Hemiptera, jemte systematiska Meddelanden;' 'Orthoptera nova descripsit C. Stål;' 'Carl Henrik Boheman' [Obituary Notice]; 'Recherches sur le Système des Mantides;' by the Author, C. Stål. 'The Entomologist's Monthly Magazine,' for February; by the Editors. 'Newman's Entomologist' and 'The Zoologist,' for February; by the Editor. 'Thesaurus Entomologicus Oxoniensis; or, Illustrations of New, Rare and Interesting Insects, for the most part contained in the Collections presented to the University of Oxford by the Rev. F. W. Hope, M.A., D.C.L., F.R.S., &c., with forty plates, from drawings by the Author,' by J. O. Westwood, M.A., F.L.S., &c., part i.; by the Author. 'Forestry: Tree-pruning viewed Entomologically;' by the Author, A. Müller, Esq.

Election of Member, &c.

Edwyn C. Reed, Esq., of the Museo Nacional, Santiago de Chile, was balloted for and elected a Member of the Society.

The Right Hon. Lord Dormer, of Grove Park, Warwick, was balloted for and elected a Subscriber.

Exhibitions, &c.

Mr. Müller exhibited the following specimens, which he had found on a recent visit to some limestone caves in the Jurassian Mountains:—

1. A blind Myriapod, found on decayed trunks of trees carried into the cave by floods.

2. A minute Podura, which had, however, become quite shrivelled.

3. A species of Hæmalastor, *Koch* (a genus of Schusselzecken) mentioned by Kolenati in 'Die Parasiten d. Chiroptern' (Dresden, 1857). Mr. Müller did not observe any bats in the cave, but the insect was creeping on one of the stalactites, from which it dropped into his hand. He believed it was the first time that any blind specimens had been found in the caves of Switzerland.

Mr. Kirby exhibited a specimen of *Lycæna Phœbe*, from Australia, described by the Rev. R. P. Murray, in the 'Entomologist's Monthly Magazine' for October last. It was stated to be quite distinct from *Lycæna Erinus*, *Fab.*, figured by H.-Schæffer under that name, though closely allied thereto.

The Secretary read extracts from a letter from Mr. W. D. Gooch, of Spring Vale, Natal, on the destruction of the coffee plantations there by a

Longicorn beetle. He stated that they were splitting up the diseased stumps, and that only about two per cent were unaffected. The larvæ bored into the tree between the forks of the root, working into the heart and feeding on the wood, as high up as nine or twelve inches above ground. A specimen of the insect was exhibited, which proved to be *Anthores leucotus*, *Pascoe*. In the bottle with the larvæ were also specimens of *Ceroplesis caffra*, but the former insect was stated to be the cause of the evil. They had split up some 5000 trees, which were diseased, and the only remedy which they had, as yet, tried, was to apply Stockholm tar to the roots: he would be glad to be advised as to the best mode of exterminating the insects. Mr. M'Lachlan remarked that it was very important to ascertain if the insect was really the original cause, or whether, as he believed, the trees were previously diseased. Mr. Müller was of opinion that the eggs were laid on sound trees, and he added that the maximum time for the appearance of the perfect insect was only about two weeks, and suggested hand-picking as they came out, a practice frequently adopted on the continent of Europe, with regard to *Melolontha*: it was also very desirable to avoid shooting the various species of insectivorous birds, which were frequently destroyed for the sake of their plumage.

Mr. Butler communicated the following in correction of a remark made at last meeting:—

“At the last meeting for scientific business I made remarks respecting *Apatura Herse* and *A. Lycaon*, of Fabricius, which seem to have been entirely misunderstood; I wish, therefore, to state clearly what are my views, in order that I may not be supposed to give in my adherence to Mr. Scudder's views respecting them.

“The synonymy of the American species is, in my opinion, as follows, viz.:—

“*Apatura Herse* and *A. Lycaon* of Scudder and Riley (*nec* Fabricius) = *Apatura Clyton* and *A. Celtis* of Boisduval, and are two distinct species.

“*Apatura Herse* and *A. Lycaon*, *Fab.*, are sexes of one species and = *Apatura Alicia*, *Edwards*.

“I have come to this conclusion from an examination of the unpublished drawings of Messrs. Jones and Abbott.”

Paper read.

A paper was communicated entitled “Descriptions of Fifteen new species of Diurnal Lepidoptera, chiefly from South America,” by Herbert Druce, F.L.S.

Mr. Dunning announced with regret the death of Mons. F. E. Guérin-Ménéville, of Paris, one of the Honorary Members of this Society.—*F. G.*

Notices of New Books.

The Naturalist in Nicaragua; a Narrative of a Residence at the Gold Mines of Chontales; Journeys in the Savannahs and Forests; with Observations on Animals and Plants, in reference to the Theory of Evolution of Living Forms. By THOMAS BELT. Post 8vo, 404 pp. letter-press. With Map and Twenty-seven Illustrations. London: John Murray. 1874.

"It was his faith,—perhaps is mine,—
That life in all its forms is one,
And that its secret conduits run
Unseen, but in unbroken line,
From the great fountain-head divine,
Through man and beast, through grain and grass."

TENNYSON.*

I HAVE always held that a reviewer has a double duty to discharge; one moiety thereof is duty to his readers, the other moiety is duty to the author; these duties are often conflicting, and hence it is difficult to discharge both with perfect impartiality. Seeing this is so, I prefer allowing the writer to hold immediate communication with the reader by means of copious extracts, thus giving the latter an opportunity of judging for himself much better than I can judge for him. The influence of a review is great or small in exact accordance with the estimation in which the reader holds the reviewer. Many superficial readers deny this; they assert boldly, "I think nothing of the Euphuist," or "I never read the Timon;" and yet we find, in ten minutes' conversation with such an one, that the Euphuist or the Timon inspires all his ideas: he unconsciously and unwittingly adopts all its teaching. Man delights to be led; it saves trouble, but he uniformly disowns this proclivity.

Mr. Belt is an evolutionist; his present reviewer a factist: they are not of necessity antagonistic, because the theory of evolution, like 'Sandford and Merton' and 'Robinson Crusoe,' is said to be "founded on fact." I am not about to discuss the hypothesis, but when an author throws down the gauntlet so boldly and so ingenuously as Mr. Belt has done, both on his title-page and in his

* Quoted by Mr. Belt.

motto, when he makes so distinct and positive a confession of faith, it would be uncourteous to ignore what he announces as the object of his book, and cowardly to refrain from expressing dissent if I cannot cordially agree with him.

Mr. Belt is a traveller; this also is patent from his own confession; he has visited many countries, has reposed under many suns; he is still, like the swallow, on the wing, for he tells his readers that when they receive his work "he will probably have turned his face homeward again, and for weeks be speeding across the Siberian steppes, wrapped in furs, listening to the sleigh-bells and wondering how his book has sped." "It is full of theories," he continues, and he adds, "he trusts not unsupported by facts." With these latter I have principally to deal, and happily they largely preponderate. I need scarcely say that Central America is the scene of the labours, and that the "Siberian steppes" are yet in the future. At present he treats only of Nicaragua; let us accompany him; we shall find him a most agreeable companion. Easy to read, pleasant to listen to; we skim his pages with the rapidity of a humming-bird; let us stop a moment to gaze on these beautiful beings. Let us visit their bathing-place.

"The foliage arched over the water, forming beautiful little dells, with small, clear pools of water. One of these was a favourite resort of humming-birds, who came there to bathe, for these gem-like birds are very frequent in their ablutions, and I spent many a half-hour in the evenings leaning against a trunk of a tree that had fallen across the stream some four or five yards below the pool, and watching them. At all times of the day they occasionally came down, but during the short twilight there was a mass of bathers, and often there were two or three at one time hovering over the pool, which was only three feet across, and dipping into it. Some would delay their evening toilet until the shades of night were thickening, and it became almost too dark to distinguish them from my stand. Three species regularly frequented the pool, and three others occasionally visited it. The commonest was the *Thalurania venusta* of Gould, the male of which is a most beautiful bird,—the front of the head and shoulder glistening purple, the throat brilliant light green, shining in particular lights like polished metal, the breast blue, and the back dark green. It was a beautiful sight to see this bird hovering over the pool, turning from side to side by quick jerks of its tail, now showing its throat a gleaming emerald, now its shoulders a glistening amethyst, then darting beneath the water, and rising instantly, throw off a shower of spray from its quivering wings, and again fly up to an overhanging bough and commence to preen its feathers. All humming-

birds bathe on the wing, and generally take three or four dips, hovering, between times, about three inches above the surface. Sometimes, when the last-mentioned species was suspended over the water, its rapidly vibrating wings looking like a mere film, a white speck, like a snow-flake, shot down the valley swift as the flight of an arrow, and stopped suddenly over the pool, startling the emerald-throat, and frightening it up amongst the overhanging branches. The intruder was the white-cap (*Microchera parvirostris* of Laurent), the smallest of thirteen different kinds of humming-birds that I noticed around Santo Domingo, being only a little more than two inches and a half in length, including the bill; but it was very pugnacious, and I have often seen it drive some of the larger birds away from a flowering tree. Its body is purplish red, with green reflections, the front of its head flat, and pearly white, and, when flying towards one, its white head is the only part seen. Sometimes the green-throat would hold its ground, and then it was comical to see them hovering over the water, jerking round from side to side, eyeing each other suspiciously, the one determining to dip, but apparently afraid to do so, for fear the other would take a mean advantage, and do it some mischief whilst under water; though what harm was possible I could not see, as there were no clothes to steal. I have seen timid bathers acting just like the birds, though from a different cause, bobbing down towards the water, but afraid to dip overhead; and the idea of comicality arose, as it does in most of the ludicrous actions of animals, from their resemblance to those of mankind."—P. 137.

I will next turn to one of Mr. Belt's "theories." After alluding to Bates's speculations on the future of the human race, especially to his idea that under the equator man will eventually attain the highest form of perfection, Mr. Belt continues—

"I have had similar thoughts when riding over hundreds of miles of fertile savannahs in Central America, where an everlasting summer and fertile land yield a harvest of fruits and grain all the year round—where it is not even necessary 'to tickle the ground with a plough to make it laugh with a harvest.' But thinking over the cause of the degeneracy of the Spaniards and Indians, I am led to believe that in climes where man has to battle with Nature for his food, not take it from her hands as a gift; where he is a worker, and not a pauper; where hard winters kill off the weak and brace up the strong; there only is that selection at work that keeps the human race advancing, and prevents it retrograding, now that Mars has been dethroned, and Vulcan set on high."—P. 172.

This is diametrically opposed to the views expressed by Mr. Bates. Mr. Belt has not failed to notice the degenerated and degenerating condition of the American Spaniards and American Indians, and

seeks an explanation in the "everlasting summer," the "fertile soil," and the boundless abundance of "fruit and grain" with which their country is blessed, and he thinks that hard work and hard winters might have arrested the downward tendency of man. Is it possible to carry out the idea? Does not the parallel fate of Nineveh and Babylon, of Thebes and Carthage, of Greece and Rome, tell a different tale? May we not attribute all those phenomena which form the staple of history to another solution, the operation of that inexorable law of decay to which all mundane entities must submit, whether individuals or empires, whether "the king-vulture-mounted mora" of Essequibo that arrested the attention of Waterton, or the canker-worm that was devouring its heart's core and battenning on its life-blood.

"The fallen trunks of trees were a likely place for beetles, and as I had brought a lantern with me, I stayed to examine them whilst Velasquez rode on to get some food ready. At night many species of beetles, especially longicorns, are to be found running over the trunks, that lie closely hidden in the day-time. The night-world is very different from that of the day."—P. 173.

These longicorns are Nature's appointed executioners; they attack the tree in its prime and pride of life; they feed on its growing vitals, and when their allotted work is performed, when life has ceased, then come a host of lamellicorns, who, like vultures, feed on the decaying carcase. The fallen tree, whether its fall be induced by the axe or the beetle, strongly foreshadows the fall of races and of empires: these phenomena are but portions of the great scheme; new trees, new enemies, new races, new empires, succeed each other like the waves of a summer sea, each always dissipating itself on the shore of time, losing itself among the pebbles; we saw not whence it came, we see not whither it has gone.

I turn from dying races and worm-eaten trees to a scene full of life, and vigour, and beauty, sketched by a master's hand. A truthful scene, as no one will doubt, and a scene painted from the life, but so painted that it may point a moral, or rather illustrate a theory.

"The weather had cleared up, white cumuli only sailed across the blue ærial ocean. The scene had no feature in it of a purely tropical character, excepting that three gaudy macaws were wheeling round and round in playful flight, now showing all red on the under surface, then turning altogether, as

if they were one body, and showing the gorgeous blue, yellow and red of the upper side gleaming in the sunshine: screaming meanwhile as they flew with harsh discordant cries. This gaudy-coloured and noisy bird seems to proclaim aloud that it fears no foe. Its formidable beak protects it from every danger, for no hawk or predatory mammal dares attack a bird so strongly armed. Here the necessity for concealment does not exist, and sexual selection has had no check in developing the brightest and most conspicuous colours. If such a bird was not able to defend itself from all foes, its loud cries would attract them; its bright colours direct them to its own destruction. The white cockatoo of Australia is a similar instance. It is equally conspicuous amongst the dark-green foliage by its pure white colour, and equally its loud screams proclaim from afar its resting-place, whilst its powerful beak protects it from all enemies excepting man. In the smaller species of parrots the beak is not sufficiently strong to protect them from their enemies, and most of them are coloured green, which makes them very difficult to distinguish amongst the leaves. I have been looking for several minutes at a tree, in which were scores of small green parrots, making an incessant noise, without being able to distinguish one; and I recollect once in Australia firing at what I thought was a solitary 'green-leek' parrot amongst a bunch of leaves, and to my astonishment five 'green-leeks' fell to the ground, the whole bunch of apparent leaves being composed of them. The bills of even the smallest parrots must, however, be very useful to them to guard the entrances to their nests in the holes of trees, in which they breed."—P. 196.

It is really delightful to accompany a man who rides a favourite hobby so well, and with such entire confidence; but it may possibly strike the reader that all big beaks,—for instance, those of the horn-bill and toucan,—are not equally adapted with that of the macaw for battle with the hawk and the eagle. Mr. Belt sees this, and explains that the toucan, by means of its powerful beak, can "defend itself against all its enemies, *especially when nesting in the hole of a tree.*" This assimilation of the objects of two such dissimilar beaks as those of the macaw and the toucan is certainly ingenious and plausible; but since both parrots and toucans nest in trunks of trees, both possess gaudy and most conspicuous plumage, I think it requires an additional hypothesis to explain why the beaks in these two tribes should be so remarkably different in all their characters. There is, however, a feature in these speculations which perhaps has been too much overlooked; they induce investigation, and this is always beneficial, even though instituted for the unworthy purpose of disputing a conclusion. Investigation

reveals truth, and truth abides for ever, unconscious of all our arguments or all our objections.

One of the principal charms of Mr. Belt's volume is its variety: whether *en route* or stationary and comparatively quiescent, he always finds something to admire, and to record and utilize for our instruction. In the steep mountain ranges of San Rafael, composed of "moraine-like heaps of clay," where "pines and oaks covered the heights," he notes that the trees "were shrouded with long fringes and festoons of the moss-like *Tillandsia* and epiphytic orchids;" and the spikes of one species, more luxuriant than the rest, and covered with mottled yellow flowers, hung down six feet in length. Five miles further on Mr. Belt turned in for the night, and found that even this orchid-bearing region was not without its little disagreeables, small drawbacks to this garden of Eden, just sufficient to give zest and enjoyment to the journey. Mr. Belt lodged in a hut, "the floor of which was the natural earth;" "there was not a bit of furniture, except some rough sleeping-places made of hides stretched on poles;" "there was not a stool or even a log to sit down upon;" "continual rain was falling, and a bleak wind was whistling through the pine tops; pigs, dogs and fowls were always in the way; a few poles had been placed across the doorway in a futile attempt to close it against the live stock," but some of the smaller pigs got through, and were routing and grunting amongst his luggage all the night long.

One of the great merits of Mr. Belt's book is that he seems to be guided by a simple and sincere love of truth; he extenuates nothing nor sets down aught in malice; his very theories seem portion of his facts, so naturally do they dovetail with his narrative. I must now accompany our traveller up the valley through which runs the river that forms the boundary between Honduras and Nicaragua; the road lay close to the river, which had to be crossed several times. The morning was lovely after a thunder-storm of the previous night, and the ride most enjoyable.

"We did not see many birds, a pretty hawk that I shot being the most noticeable. Hawks of various kinds are very abundant in the tropics, and if the small birds had to personify death, they would certainly represent him as a hawk, for this is the form in which he must generally appear to them. Towards evening the hawk glides noiselessly along and alights on a bough near, where he hears the small birds twittering amongst the bushes. Perhaps they see him and are quiet for a little, but he sits motionless as the sphinx,

and they soon get over their fear and resume their play or feeding. Then suddenly a dark mass swoops down and rises again. It is the hawk with a small bird grasped in his strong talons, gasping out its last breath. Its comrades are terror-struck for a moment and dash madly into the thickets, but soon forget their fear. They chirp to each other, the scattered birds reunite; there is a fluttering and twittering, a rearranging of mates, then again songs, feeding, love, jealousy and bickerings."—P. 257.

I cannot forbear making another extract on travelling: the delicious cool of morning, with all its exhilarating effects; the noontide heat, and its exhausting power on the human frame; the welcome return of evening bringing its refreshing, but not entirely compensating, influence, could not be more graphically described.

"The country at first was level, and the roads smooth and dry. The morning was delightfully cool; and as we trotted along our spirits were high and gay, and snatches of song sprang unbidden to our lips. How delightful these rides in the early morning were! how all nature seemed to be in accord with our feelings! Every bush and tree were noted, every bird-call heard. We would shout to one another, 'Do you see this or that?' or set Rito off in convulsions with some thin joke. Every sense was gratified; it was like the youth of life. But as the day wore on, the sun would shine hotter and hotter; what had been a pleasure became a toil; and we would push on determinedly but silently. The day would wear on, and our shadows come again and begin to lengthen; the heat of the day was past, but our spirits would not mount to their morning's height. The beautiful flowers, the curious thorny bushes, the gorgeous butterflies, and many-coloured birds, were all there; but our attention could only be called unwillingly to them. Our jaded animals trudged on with mechanical steps; and, tired ourselves, we thought of nothing but getting to the end of our day's journey, and resting our weary frames."—P. 285.

In connection with these travelling experiences in a region so little known to Europeans it seems desirable to state its inexpensive character as a leading feature. There is no temptation to spend, indeed scarcely any possibility of spending, in that profuse and extravagant manner which causes the Englishman to be ridiculed and robbed throughout every country in Europe. The travellers were at the residence of Don Filiberto Trano, a "cattle-raiser," which they reached shortly before the conclusion of the journey. The Don's family consisted of a wife and four or five children. They had just prepared a fowl for their own dinner; it was stewing with green beans and other vegetables, and the entire repast was

set before the travellers, saying they would cook something else for their own dinner. They were too hungry to remonstrate, and gladly availed themselves of the opportunity. The narrator says that he *enjoyed* but two meals on the whole journey, and this was one of them: but we must come to the cost.

"When we came to settle up with our host, he proposed to charge us twenty-five cents, just one shilling, or fourpence each. They had given us a good dinner, and put themselves to much inconvenience to provide me with a bedstead, and this was their modest charge. Nor did they make it with any expectation that we would give more. It is the universal custom amongst the Mestizo peasantry to entertain travellers; to give them the best they have, and to charge for the bare value of the provisions, and nothing for the lodging. We could so depend upon the hospitality of the lower classes that every day we travelled on without any settled place to pass the night, convinced that we should be received with welcome at any hut that we might arrive at when our mules got tired or night came on. The only place in the whole journey where we had been received with hesitation was at the Indian-house, a day's journey beyond Olama. There the people were pure Indians, and other circumstances made me conclude that the Indians were not so hospitable as the Mestizos."—P. 311.

I will mention another theory of Mr. Belt's, although not peculiar to him; it is that animals which are very conspicuous in appearance, and therefore readily observed and easily captured, have usually some decided property which is distasteful to those other animals which might be supposed to take them for food: by this property, whatever it may be, insects are often preserved from the attacks of insectivorous mammals and birds; there is therefore no need of the protection of inconspicuousness; they have no need of concealment, and appear to delight in the display of their beauty, or what some would describe as the "loudness of their colouring:" the wasps and fossorial Hymenoptera, beautifully banded with red, yellow and black, or rendered attractive by the richly metallic golden green, are armed with very powerful stings; and hence the very sight of these beautiful creatures seems to carry with it an instinctive conviction that it is not good to meddle with them; and it is curious to see spiders liberating a captive wasp for the same reason, or perhaps more correctly speaking, from the same instinctive knowledge. The common garden spider (*Epeira diadema*) invariably practices this mode of disposing of an objectionable captive; she, for they are always female, carefully cuts the cables by which a

wasp is held, and lets him fall to the ground to make what use he may of his liberty, if liberty it can be called, for on falling he almost invariably finds himself encumbered by portions of the clammy web: so it is in the tropics; the spiders, though well armed with offensive weapons, prefer to release those gorgeous captives whose means of resistance or defence they think it desirable to evade. This theory Mr. Bates further illustrates as follows:—

“Amongst the mammals, I think the skunk is an example of the same kind. Its white tail, laid back on its black body, makes it very conspicuous in the dusk when it roams about, so that it is not likely to be pounced upon by any of the Carnivora mistaking it for other night-roaming animals. In reptiles, the beautifully banded coral snake (*Elaps*), whose bite is deadly, is marked as conspicuously as any noxious caterpillar with bright bands of black, yellow and red. I only met with one other example amongst the Vertebrata, and it was also a reptile. In the wood around Santa Domingo there are many frogs. Some are green or brown, and imitate green or dead leaves, and live amongst foliage. Others are dirty earth-coloured, and hide in holes and under logs. All these come out only at night to feed, and they are all preyed upon by snakes and birds. In contrast with these obscurely coloured species, another little frog hops about in the day-time, dressed in a bright livery of red and blue. He cannot be mistaken for any other, and his flaming vest and blue stockings show that he does not court concealment. He is very abundant in the damp woods, and I was convinced he was uneatable as soon as I made his acquaintance and saw the happy sense of security with which he hopped about. I took a few specimens home with me, and tried my fowls and ducks with them; but none would touch them. At last, by throwing down pieces of meat, for which there was a great competition amongst them, I managed to entice a young duck into snatching up one of the little frogs. Instead of swallowing it, however, it instantly threw it out of its mouth, and went about jerking its head as if trying to throw off some unpleasant taste.”—P. 320.

The corpulent iguanas and their enemies, the pisoti, offer one more temptation to make an extract, and this must be the last. I fear I have already exceeded the bounds of moderation, but I know not which of these extracts I can suppress. It is some satisfaction to find I have given much more space to Mr. Belt than to myself. How great would be the boon to Science if every naturalist would thus record his observations; how much greater the boon if every traveller would become a naturalist and an author, so that not a single fact should escape notice, but be preserved for ever.

“The road passed along a sandy bridge only a little elevated above the waters of the lake, and the ground on both sides was submerged. As we travelled on we were often startled by hearing sudden plunges into the water not far from us, but our view was so obstructed by bushes that it was some time before we discovered the cause. At last we found that the noise was made by large iguana lizards, some of them three feet long, and very bulky, dropping from the branches of trees, on which they lay stretched, into the water. These iguanas are extremely ugly, but are said to be delicious eating, the Indians being extremely fond of them. The Carca Indians, who live in the forest seven miles from Santa Domingo, travel every year to the great lake to catch iguanas, which abound on the dry hills near it. They seize them as they lay on the branches of the trees, with a loop at the end of a long stick. They then break the middle toe of each foot, and tie the feet together, in pairs, by the broken toes, afterwards sewing up the mouth of the poor reptiles, and carrying them in this state back to their houses in the forest, where they are kept alive until required for food. The racoon-like ‘pisoti’ is also fond of them, but cannot so easily catch them. He has to climb every tree, and then, unless he can surprise them asleep, they drop from the branch to the ground and scuttle off to another tree. I once saw a solitary pisoti hunting for iguanas amongst some bushes near the lake, where they are very numerous, but during the quarter of an hour that I watched him he never caught one. It was like the game of ‘puss in the corner.’ He would ascend a small tree on which there were several; but down they would drop when he had nearly reached them, and rush off to another tree. Master ‘Pisoti,’ however, seemed to take all his disappointments with the greatest coolness, and continued the pursuit unflaggingly. Doubtless experience had taught him that his perseverance would ultimately be rewarded: that sooner or later he would surprise a corpulent iguana fast asleep on some branch, or too late in dropping from his resting-place. In the forest I always saw the ‘pisoti’ hunting in large bands, from which an iguana would have small chance of escape, for some were searching along the ground, whilst others ranged over the branches of the trees.”—P. 338.

I have one more word to say, and that is to express my gratitude: I feel truly grateful for the information I have gained with so little labour and with such abundant pleasure. May Mr. Belt live long to explore other countries, and may he record thus agreeably all his explorations,—aye, and all his theories.

EDWARD NEWMAN.

Curious Malformation of the Incisor Teeth in the Skulls of Two Rats. By FRANCIS HANCOCK BALKWILL, Esq.

I SEND for your inspection two rats' skulls, in which the incisor teeth, from not meeting properly, have failed to wear away their antagonists, and, as these teeth continue to grow during life, the result has been a very curious deformity. Similar instances have been recorded of the hare, rabbit and hippopotamus. I believe, in the two former animals, it has been attributed to the accident of the opposing tooth having been shot away.

The larger of the two skulls was sent to me in the flesh, directly after it had been caught in a trap, in a warehouse in Cork, by the late Mr. J. H. Richardson, of Newcastle.

The cause of the deformity has evidently been a large malignant tumour (cancer) in the body of the lower jaw on the left side just behind the molar teeth, occupying the whole of the bone there, and enlarging it so as to lengthen that side and throw the tops of the lower incisor teeth a little to the right of their true position; in consequence the left upper incisor has escaped wear, and has grown so that, estimating as nearly as possible where the tooth originates in the bone, it has completed about three-quarters of a circle, instead of only half, its normal size.

The rat, which was the common brown, was in good condition, notwithstanding that the disease had so involved and softened the bones as to make it quite impossible to get a perfect skull.

The other, which is much more unique, was also brought me in the flesh, by Mr. W. C. James, one of his men having just caught it in his starch manufactory. It was an old English black rat,—a species which he informs me is not at all dying out on the starch works,—in good health and condition, with nothing that can with any certainty be pointed to as accounting for its extraordinary appearance.

From some cause, in early life, the front of the lower jaw has been deflected a little to the left, so as to allow the upper and lower incisors to pass each other without meeting. How old it was at death I should not like to say, but it had lived long enough for the right upper incisor to have made two entire circles,—that is, looking at the head in profile, the point of the tooth just reaches to where the tooth commences to be formed in the jaw; and as

the tooth was directed a little outward it has formed a spiral, very similar in shape and size to what would be found by cutting off the last two turns of a closely-twisted corkscrew.

The left incisor being deflected inwards has entered the superior maxillary bone again very near the origin of the right incisor, and after penetrating the bone for nearly a quarter of an inch, and completed rather more than a circle, it must have found the resistance too great to overcome, and ceased growing, otherwise it should be as long as its fellow.

The lower incisors describing so much longer a curve have been more subject to accident, and have apparently been broken, the left quite recently, possibly when captured, as was the right upper, to little more than its normal length. The right, which is about half an inch longer than it ought to be, had grown through the upper lip, and by continual pressure produced a slight but decided malformation of the intermaxillary and nasal bones.

The right lower maxilla is a little longer than the left, but whether this was the cause or result of the deformity I could not say. The first curve of the right upper incisor is a good deal smaller than it becomes afterwards, showing the youth of the animal on the first occurrence of the irregularity.

It is strange that with such disadvantages the animal should have been able to maintain its condition, and that the vascular tissues should have permitted themselves to be pierced as they were without the least sign of inflammation.

F. H. BALKWILL.

Notes on the Birds of New Zealand.

By T. H. POTTS, Esq., F.L.S.

(Continued from Zool. S. S. 3716.)

Saddleback (*Creadion carunculatus*, Gmel.).—The “saddleback” of the settlers (“tieke” of the natives), which a few years since was commonly met with in the more thickly wooded portions of Banks Peninsula, is now of rare occurrence there. The extensive area of growing timber at the Little River Bush will probably be its last refuge in that part of the country, so rapidly is the Peninsula becoming disforested. Although we have met with, and have known of the nest of this striking looking bird in the more open parts of

the forest, yet it seeks and loves the shady covert of the densest bush, where decaying tree and damp mosses conceal an insect-food supply. It does not appear to be strong on the wing; we have never seen it attempt a lengthened flight, yet its movements are notably prompt, rapid and decided. It usually announces its sudden approach by a shrill note unlike that of any other bird we know; it sounds like "chee-per-per, chee-per-per," repeated several times in quick succession. No sooner is this call-note heard than the bird emerges from its leafy screen and bounds before the spectator as suddenly as harlequin in a pantomime. From these abrupt movements, or flying leaps, thus shrilly accompanied, it seems to perform a rôle of its own that appears almost startling amidst the umbrageous serenity of the forest. Let the eye follow its motions, that are so quickly changed, and watch the tieke perched for a few moments on the lichen-mottled bole of some fallen tree—a favourite position: its glossy black plumage is relieved from sameness by the quaint saddle-mark of deep ferruginous that crosses its back and wings; the red caruncles add much to the sprightliness of its air: the observer will probably notice that its attitude is peculiar, or, in colonial phrase, "it has a queer set on it." The head and tail are kept rather elevated; the feathers of the tail take a gently sweeping curve; the bird looks as though prepared to leap: one more glance, and it is away, climbing some moss-clothed trunk, or picking its food from beneath the flakes and ragged strips of bark that hang from the brown-stemmed fuchsia tree. It must be an early breeder. On the Teremakau we have seen the young, almost of adult size, in the first week of December. For its nesting-place a hollow or decayed tree is usually selected, sometimes the top of a tree-fern is preferred. The first nest we knew of was found by an old friend in a hole about four feet from the ground in a huge white pine, kahikatea (*Podocarpus dacrydoides*), close to the bank of the Ahaura river; it contained three eggs hard-set. We found a nest in a dead tree-fern not far from Lake Mapourika, Westland: this was of slight construction, built principally of fern-root, deftly woven into rather a deep-shaped nest with thin walls; as the structure just filled the hollow top of the tree-fern thick walls were unnecessary. Another nest, in a small-sized decayed tree in the Okarita bush, was in a hole not more than three feet from the ground; it was roughly constructed, principally of fibres and midribs of decayed leaves of

the kiekie (*Freycinetia Banksii*), with a few tufts of moss, leaves of rimu, lined with moss and down of tree-ferns (*Cyathea*); it measured across from outside to outside of wall twelve inches six lines, cavity three inches diameter, depth of cavity two inches. The egg, measuring nearly one inch four lines through the axis, with a breadth of eleven lines and a half, is white, sprinkled over with faint purplish marks, towards the broad end brownish purple, almost forming one large blotch. The breeding season probably extends from September to January; the young are protected and fed by the old birds till almost full grown; they are summoned by the parent birds with their usual call, nor from this does the note of their active offspring greatly differ: the saddleback quickly responds to the summoning note of its species. An imitation of the sound by the assistance of a leaf between the lips serves to attract its presence, and is sometimes used by the collector for this purpose. The next point to be considered is the plumage; that of the adult is easily described, for the feathers of the sexes fail to exhibit any distinction. The collection in the Canterbury Museum contains numerous specimens in the young state, procured at different seasons of the year:—

A.—Female obtained on Banks Peninsula, in the month of March (our autumnal period), has the whole plumage cinereous-brown, slightly flushed with rufous, excepting bastard wing and the inner webs of the tail-feathers, which are black; outer wing-coverts margined with ferruginous; upper and under tail-coverts ferruginous; wattles very small, pale yellow; mandibles black, except the edge of the basal portion of the lower mandible, which is margined with yellow for a distance of six lines; tarsi and feet black; claws horn-colour; length of the bill from gape one inch four lines.

B.—Male killed at Little River Bush in November (early summer), differs but little from the preceding specimen, except that the caruncles are more developed, and the bill is longer by two lines.

C.—Male obtained in the bush near Akaroa, in August (the last winter month), has a warmer tinge of ferruginous flecked on the interscapulars and dorsals.

D.—Female, procured on the same day at the same locality, differs only from specimen A in being less warmly tinted with rufous.

E.—Male, killed near Akaroa, in the same month (August), has the interscapulars and dorsals margined with rich ferruginous; the yellow edge on the basal part of lower mandible indistinct.

F.—Male, obtained on Banks Peninsula, in March, has the growing secondaries and rectrices black; a sprinkling of the same colour on the auriculars; upper wing-coverts, dorsals, upper and under tail-coverts, ferruginous.

It may be noted, from the description of these specimens of the young state, how much variation may be met with, owing in part to the extended breeding-season perhaps; and it may be that the adult state is not arrived at till the second year. The plumage of the adult bird is deep glossy black; back, wing-coverts, upper and lower tail-coverts ferruginous; bill, tarsi and feet black; irides dark brown; caruncles from yellow to red; bill from gape one inch five lines; tarsus one inch six lines; wing from flexure four inches; tail three inches six lines; total length ten inches; weight two ounces and three-quarters. The tieke abounds in the Westland bush; its note is there one of the common bird-sounds: it finds abundant means of support in the insect-life which exists out of reach of the kiwi. Last season my friend revisited the kahikatea on the bank of the Ahaura, but the saddlebacks had not again resorted to the hole for breeding.

Big Kiwi (*Apteryx australis*, *Shaw*); “rowi” of the natives; “big kiwi” of the miners.—Why should there be so much mystery about the habits of birds so well known as kiwis? Their flesh has for years been recognized as forming a part of the bush-food of the prospector or digger in Westland; just as much so, indeed, as that of the pigeon, the weka or the kaka, still we have not any minute history of this quaint-looking creature. There are, in the writer’s opinion, probably five or six species of *Apteryx*; of these all but one are supposed to exist on the South Island, whilst *A. Mantelli* is now the sole representative of the race in the North Island. The rowi, or big kiwi, of the west coast of the South Island, is far more local in its distribution than is *A. Oweni*, or even perhaps than *A. Mantelli*: according to Mr. Docherty, it is known to inhabit certain districts, the well-defined boundaries of which it does not attempt to pass: its range is as isolated and distinctly marked as though impassable barriers existed between its haunts and the surrounding country. We have had many opportunities of watching the mode of progression of three kinds of kiwi, and of judging of

the defensive powers of the bird, supposed to be conferred by the robust tarsus and foot, which have gallinaceous characteristics much more prominent in life than in the best-preserved specimens. The articulation of the tibia with the tarsus is one of great strength; the powerful scale-defended leg is united to a foot furnished with strong claws, with which the bird scratches for its food, after being directed thereto by its powerful olfactory organs. We believe that the beautifully organized bill (which should be observed in life, to understand its delicacy) is used solely for probing into soft humus, moss and decayed wood. When the rowi is irritated it makes a cracking noise by snapping the mandibles together very rapidly. In attempting to defend itself it displays an awkward feebleness rather than a posture of self-protection, by striking forwards with its foot, as in the act of scratching, at a line about its own height, and its only defence against dogs is in concealment. In walking the step is peculiar, the foot is lifted deliberately, and rather high above the ground, its gait reminding one of the movements of a person walking stealthily. Its run is a slinging trot; but in fairness it should be remembered that our judgment of its locomotive powers is based on the blundering efforts of the wretched animal half-blinded by the unaccustomed glare of daylight, or frightened and dazzled by artificial light at night. There are a few other points in its organization which must be taken into consideration. In the first place, the feathers are soft, flocculent and silky towards the base, whilst the distal portions terminate in produced hair-like webs, the plumage consisting simply of clothing feathers, which during the progress of the bird give out no sound of fluttering or rustling. This peculiarity of the plumage confers another advantage by its compressibility, whilst it can be kept far cleaner than the integument of birds having feathers with closer vanes, interlocking barbules or thicker down, as with this hair-like dress a single shake rids the bird of every foreign particle, while the feathers, covering the body like a thatch, effectually keep off the wet of the ever-humid ferns and mosses among which the bird lives. If an *Apteryx* be plucked, its body will be found somewhat conical from the point of the bill to the thighs—a form well devised for gliding through the thick ferny bottoms choked with the heavy fronds of *Todea superba* or the close-trailing folds of *Freycinetia*, and enabling the long bill to be used to the greatest advantage in exploring deep but narrow fissures about the roots of trees.

It is probable that the rowi pairs for life, for there appears to exist between the sexes a lasting companionship. For a nesting-place it selects a hole in some huge tree or log, or amongst roots; sometimes the hole is excavated in a soft bank, where the soil is light; but in every case care is taken that the site shall be on a ridge or dry ground. We examined a nesting-place on the 17th of December last, which was tunnelled in a mound of light earth, probably formed by the uprooting of some forest giant: the entrance was nine inches in diameter; a chamber was found to be excavated to the left of the entrance; from this to the back of the chamber was a depth of three feet, with a height of fifteen inches. This retreat had been abandoned by the family, but we picked pieces of egg-shell from the floor. The breeding-season extends over some months, from October to February. Two eggs are usually laid, on which the old birds rather lie than sit. The mode of roosting is very peculiar: they squat opposite each other, with their legs bent under them, each with the head tucked under its scanty apology for a wing; if there are young in the hole they also assume a similar position, on either side a young bird between the two parents: thus the result of this singular arrangement of the family is a nearly perfect hemisphere of feathers. They often appear torpid or very drowsy when surprised in their homes, sometimes remaining quite undisturbed by noise, and are very rarely discovered except in a hole. In good condition a bird will average from five to six pounds in weight. Their cry is much harsher than that of the kiwi, sounding something like "cr-r-r-ruck, cr-r-r-ruck," and is not uttered till after sundown: from timed observations in the bush, we noticed that when the sun set about 7.30 we did not hear the rowi till from 8.15 to 8.30. The young are well clothed when they leave the shell; with them the bill is not curved; following the ridge of the upper mandible it is slightly depressed about the middle of its length. The general colour of *A. australis* is grayish brown, streaked with black in the young and adult state; in some fine old birds a glint of golden chestnut edges part of the plumage. Not unfrequently specimens have the aural feathers of dull yellowish white or gray, the same hoary tone of colour being sometimes found on the occiput, chin, neck and front of the thighs: these marks are not confined to sex. In giving measurements of species, where an extensive collection yields an ample series from which selections can be made, care should be taken not to give dimensions of extraordinary

specimens unless that fact is duly noted. A fairly average pair of *A. australis* from the Canterbury Museum afford the following measurements:—

	Male.	Female.
Bill from gape . . .	4 inches 6 lines.	6 inches 4 lines.
Tarsus . . .	2 „ 8 „	2 „ 11 „
Middle toe and claw . . .	2 „ 9 „	3 „ 0 „
Length . . .	21 „ 9 „	25 „ 0 „

These specimens were obtained by Mr. Docherty, together with a large number of others, both of *A. australis* and *A. Oweni*, from the West Coast near Okarita. We cannot conclude these notes on the big kiwi (*A. australis*) without expressing our sorrow at the impending fate of this interesting bird. It is rapidly becoming rare, from the demand for specimens for collections: the number of skins and skeletons received at the Canterbury Museum alone is very great, and nothing but prompt action will save the rowi from extermination.

Ornithological Notes from North Lincolnshire.

By JOHN CORDEAUX, Esq.

(Continued from S. S. 3859.)

JANUARY AND FEBRUARY, 1874.

Turnstone.—January 16. We always meet with a few all through the winter on this coast, although the bulk of the autumn arrivals go farther southward. I got an immature bird to-day from the shore near Cleethorpes.

Godwit.—A few bartailed godwits remain to winter on this coast, the blacktailed godwit never.

Redshank.—January 27. Observed this morning many small flocks between Tetney and North Cotes, one of these containing over thirty birds.

Twite and Snow Bunting.—Very numerous on the fitties along the coast, where they come each day to feed upon the seeds of various salt-loving plants. I see also flocks of the common or corn bunting in the same localities. The blackheaded bunting is likewise largely represented, but does not congregate like the other small birds, keeping more in small family parties.

Wild-fowl on the Lincolnshire Coast.—January 27. There were this afternoon very considerable numbers of wigeon, common wild

ducks, and a few sheldrakes swimming off the entrance to the Grainthorpe Haven, and farther out, in the direction of the Haile Sand—looking not unlike patches of floating wrack—hundreds of black scoters.

Golden Plover.—February 1. Spring note of golden plover.

Pintail.—February 20. I got to-day a very fine specimen of this elegant and graceful duck. It was an old male in full breeding plumage, shot on this coast near Cleethorpes. The gizzard, which is very powerful and muscular, contained only the seeds of one of the Cruciferæ—I believe of the common scurvy grass (*Cochlearia officinalis*).

Coal Tit.—February 21. Spring note heard.

Misseltoe Thrush.—February 21. Have returned in pairs to their nesting-haunts in the garden.

Ringed Plover.—February 23. Spring note first heard on flats.

Wigeon.—February 24. The wigeon have paired, males and females swimming together, but keeping at the same time in large flocks. The male is now in full breeding plumage. I found the gizzard of an old male skinned this evening crammed with fine white sand, full of little black specks like coal-dust. Under the microscope, these black spots resolved themselves into the seeds, apparently, of some species of *Carex*. The sand had evidently been swallowed in scooping up the seeds.

Pinkfooted Goose.—Several small flocks have recently visited the Humber. I have seen altogether about eight geese that have been killed during the winter within this district, and in every case found that they belonged to this species.

JOHN CORDEAUX.

Great Cotes, Uleby, Lincolnshire.

March 3, 1874.

Ornithological Notes from Devonshire, Cornwall, &c.

By JOHN GATCOMBE, Esq.

(Continued from S. S. 3912).

FEBRUARY, 1874.

7th. To-day I examined a common guillemot, which had already assumed the perfect breeding-plumage; there were also five fine shovelers, three old males and two females, in the Plymouth Market,

said to have been killed on the river Yealm: this species is very uncommon in our neighbourhood. I was informed by a fisherman that there were now hundreds of gannets in the channel off Plymouth, and that he had also met with some puffins (which he called "popes"); this seems very early for the appearance of the last-named species, but it might be owing to the extraordinary mildness of the season. The mackerel-boats are now beginning to bring in quantities of guillemots, and a few razorbills, in every stage of plumage.

8th. Saw three shags at a birdstuffer's, one of which was in nearly perfect breeding-dress, whilst the other two were only just beginning to change. Large numbers of these birds are now daily seen in the water and on the rocks near the Mewstone, at the mouth of the river Yealm. I believe the plumage of the female shag in summer to be finer even than that of the male, and that the same may be said of the cormorant.

14th. There were three more old male shovelers in the Plymouth Market, killed on one of the rivers or estuaries in this neighbourhood.

19th. Walked along the coast beyond Bovisand, and observed several cormorants, which showed the white patch on the thighs peculiar to the breeding-season.

20th. Remarked a pied wagtail in apparently full summer dress. I believe that a large number of the birds of this species we see in early spring are migrants.

23rd. Observed a small party of wood larks, some of which rested on a telegraph-wire; this I have often seen them do before. Starlings are already taking possession of the "air-holes" in the high walls of the ramparts surrounding Devonport, in which large numbers breed. Watched twelve herons, one after another, silently crossing from the trees on which they had been resting during high water, in Warleigh Wood, to their fishing-places on the opposite side of the river Tamar, the mud-banks of which were just beginning to appear. This morning I examined the contents of the stomach of a brown owl, in which were the remains of an immense rat, the long and thick tail of which was quite perfect. What a pity it is that so many of these useful birds should be shot and trapped by our gamekeepers. Many kestrels and green woodpeckers have also been killed in this neighbourhood.

24th. Saw a large flock of *Larus ridibundus* on the water, many

of which had already acquired the dark head of the breeding season. I also met with a few ravens on the coast.

27th. Was shown a fine specimen of the spotted redshank, which had been lately killed in the estuary at the mouth of the river Erme. It was in perfect winter plumage, and is a rare bird in Devonshire.

JOHN GATCOMBE.

8, Lower Durnford Street, Stonehouse, Plymouth,
March 11, 1874.

Remarks on Birds seen during a Three Weeks' Tour in Brittany.
By Captain HENRY HADFIELD.

Gannet, Redthroated Diver and Guillemot.—On approaching the French coast, after passing Jersey, a few gannets were observed in the distance, and redthroated divers and guillemots, disturbed at their morning's repast, were constantly passing and repassing, increasing in numbers as the harbour of St. Malo was neared.

Jay.—During my rambles on shore I was agreeably surprised to find birds still so numerous, notwithstanding all that has been said and written; for instance, that beautiful bird, the jay, was not only found in every wood and copse, but was seen flitting from pollard to pollard by the roadside.

Magpie.—The magpie is almost, if not quite, as numerous as the jay; less wary, too, allowing one, gun in hand and dog at heel, to approach within some forty or fifty yards; and on one occasion, when sauntering about the town of Lannion, a pair of magpies alighted close to me, and began to search for the small fish and fry falling from the nets hung up to dry on the public esplanade skirting a tidal basin. Seeing them so tame, I inquired whether they belonged to any one, but it appeared not, and their perfect state of plumage went far to prove it. One day, when walking through a densely wooded district, I observed towards sunset numbers of magpies passing overhead, sometimes singly, but more frequently in strings or irregular flocks, all flying in the same direction to their roosting quarters.

Hooded Crow.—The hooded crow was found a common though not a very numerous species.

Rook.—Rooks were not so plentiful as with us, nor did I observe a single large flock or a rookery.

Jackdaw.—Jackdaws were seen at St. Pol de Leon, wheeling round and about the tower and spire of the old church of Notre Dame de Kreisker, which is three hundred and sixty-six feet in height, in the open mullion-work of which they may possibly breed.

Crested Lark.—This interesting species was observed at Roscoff in small numbers, generally two or three together, feeding on a much frequented road and causeway leading to the harbour, where carts were constantly passing to and from the vessels lying alongside the mole. On the near approach of a cart they would rise on wing, and wheeling round re-settle on the same spot; this I observed them do again and again, and so tame or fearless were they that they would allow one to get within five or six yards of them. What they were feeding on I could not make out; but the road being hard and well worn, there could be little found except chance grains of corn, or may be insects attracted by the horses and cattle. Though it has been said to resemble the sky lark it differs greatly in shape and somewhat in size, being shorter, particularly in the tail, and in that respect more like the wood lark: its walk is not so stately, nor is the head held so erect as that of the former. Yarrell tells us that this species is "like the common lark in form," and that "its tail is long"; and the figure might be taken for that of the sky lark, but then it was delineated from a stuffed specimen, which the taxidermist had doubtless made to stand erect, whereas the crested lark has a crouching, stealthy walk, the neck contracted. Morris's figure is more exact, and the position more natural, though it is represented with crest erect, whereas those I saw had it usually depressed or recumbent, but at all times distinguishable: his remarks on some of its habits tally with my observations—for instance, its approaching habitations, and being solitary rather than gregarious.

Chaffinch, &c.—Of small birds the chaffinch is by far the most numerous, and is to be met with everywhere; in no part of England have I seen them in such abundance or so familiar. The house sparrow, on the contrary, is comparatively scarce, and so is the hedgesparrow.

Sky Lark.—The sky lark was seen in considerable flocks, though a much persecuted species, being in great request for the table.

Goldencrested Wren.—Several were seen in a fir-plantation at Quimper, and it is seemingly a numerous species, being too small a *gibier* for the table.

White Wagtail.—The white wagtail was the only species of *Motacilla* seen; but as none were shot or closely examined I could only judge from their being of a light gray colour on the back. It would puzzle an unscientific observer to discover why a gray bird should be called "white," but it might puzzle him still more to find a black bird named the "white wagtail" and a yellow wagtail the "gray."

Tree Sparrow.—Numerous nests of this species, I believe, were observed in some tall and leafless trees by the roadside.

Woodcock and Snipe.—Woodcocks and snipe were scarce, owing to the mildness of the season—neither frost nor snow up to the 19th of November, at which date I left for Paris. There had been flights of woodcocks early in the month, but in such open weather, in a well-wooded country like Brittany, they are so dispersed that few are met with; and in wet weather snipes are scattered over the moors and heaths.

Gulls.—On the coast, particularly at Concarneau and Carnac, many gulls were seen in the distance; and I may remark that I never saw them in such numbers except at their breeding-stations, but it is readily accounted for, fish being so abundant, more so than in any part of the world I have visited, except the coast of Malabar.

HENRY HADFIELD.

Ventnor, Isle of Wight, February 9, 1874.

Fish and Crustacea in the Tanks, &c., at Concarneau.

By Captain H. HADFIELD.

It may give some idea of the immense quantity of fish caught on the coast, if I state what came under my observation when at Concarneau. At an early hour I was awakened by a great commotion and a clattering of sabots, and on looking out beheld a prodigious quantity of fish exposed for sale, well nigh covering the street; still more and more were being brought, literally carpetting the ground, being spread out on cloths, the soles in pairs—the street thereby transformed into a busy market, to which the townspeople were flocking. The quantity of fish taken is far too great for home consumption, and much is sent up to Paris.

Wonderful as this sight was, an inspection of living fish and Crustacea, in the far-famed tanks, was more surprising still. Hewn

out of the rock, these tanks cover a space of a thousand square yards or more, sheltered and protected from the sea by massive walls. At high water these basins are many feet in depth, and the fish are discerned with difficulty, nor could I see any in one of the tanks till an attendant directed my attention to some light and glistening spots on dark objects at the bottom; these he said were turbot, but there must have been brills amongst them. On food being thrown in, the whole tank was in commotion, the fish darting here and there in quest of it, some coming to the surface almost perpendicularly, and with wonderful speed and agility; and their manner of swimming is most graceful, too—propelled, as well as guided, by the powerful and pliant tail.

The tank containing crayfish is so well stocked and closely packed that they completely cover the surface, and I was informed that they consume daily two hundredweight of dogfish and other common species. I saw them fed, and it was amusing to observe these awkward long-legged creatures, not unlike huge spiders, crawling on and over each other's backs in search of the dainty morsels, which were greedily seized and devoured.

In an adjoining tank lobsters were to be seen in great numbers, some crawling about the steps leading down to the water, having been left high and dry by the receding tide, but they appeared none the worse for it. Some of the lobsters were of great size, others differing in colour from the common kind, being of a bright and intense blue. Of the common lobster (*Cancer gammarus*) Cuvier remarks, "C'est un des Crustacés de mer que l'on sert le plus sur nos tables." In the 'Dictionnaire Classique,' it is said, "Sa taille est souvent gigantesque, on le trouve communément dans la Méditerranée et dans l'océan." There was also the *Palinurus*, or spring lobster, somewhat resembling the crayfish, to which it is seemingly allied, and is here most abundant, well nigh as much so as the common lobster.

In another tank a shark was seen, living peaceably and amicably with numerous other fish, with which it had fraternized; but, being well fed, a satiated appetite may perhaps account for its forbearance.

My acquaintance with fish and Crustacea being slight, I shall not venture into other tanks, as I might get out of my depth, but may say a word or two about the aquarium adjoining, where fish and Crustacea are bred, and where they may be traced from the spawn

through the different stages and metamorphoses, from exclusion to maturity, not to say old age—as there is no knowing at present at what age they may arrive; the growth of the lobster, for instance, must be very slow, seeing that one of two years was of very moderate size, and some fishes are well nigh as slow of growth.

Mr. Newman, in the 'Zoologist' for February (S. S. 3878), expresses regret at having missed seeing the porpoise in the Brighton Aquarium: having been more fortunate, and watched its movements for a considerable time, I am of opinion that it is chiefly propelled by an alternate lateral motion of the posterior parts, though the transverse tail-fin may, and doubtless does, assist the porpoise in the undulations of its course; but the rapidity with which it swims, even in confinement, is confusing to the sight.

HENRY HADFIELD.

Rhinoceros Sondaicus at the Zoological Gardens.

By EDWARD NEWMAN.

EDWARD BLYTH, whose knowledge of Indian Mammalia was unrivalled, and whose death we are still lamenting, published, at page 8506 of the 'Zoologist' for 1863, the most exhaustive "Memoir on the living Asiatic Species of Rhinoceros" that has ever appeared. He collected every previously printed allusion to these huge beasts, and systematized the whole into one masterly essay. One of the most remarkable inferences from this paper is that the adult male rhinoceros which lived so many years at the Zoo, and for which the Society paid £1000, was *Rhinoceros sondaicus*, the species now exhibiting in the Elephant House. It seems singular that any doubt should exist on such a point, and forcibly illustrates the necessity of having drawings made of every animal added to that grand collection, excepting when an undoubted individual of a species previously figured; such a collection of drawings would not only prove a source of educational and instructive interest, but form an invaluable historical record of that admirable institution.

The two species of Asiatic one-horned rhinoceros may be supposed included by Linnæus under the name of *Rhinoceros unicornis*, while his *Rhinoceros bicornis* may be supposed to include the genus as represented by the African species. This division is, however, by no means exact, since the one-horned Asiatic rhinoceros unquestionably includes two species, which have

been respectively named *R. indicus* and *R. sondaicus*, and it is now supposed that Asia or its islands possess in addition two two-horned species, which have been called *R. malayanus* and *R. lasiotis*; the latter is comparatively new, and was exhibited for the first time in the Gardens last year. These two, concerning which much has been written, agree in possessing two horns and a skin without conspicuous flaps or folds; both species have been exhibited in the Regent's Park, and one, *Lasiotis*, is still living in apparent health.

The two one-horned species are now called *R. unicornis* and *R. sondaicus*; the former, according to Mr. Blyth, is confined to the tarai region at the foot of the Himalayas and the valley of the Brahmaputra or province of Assam; while *R. sondaicus* is the more common and ordinary species of the Malayan peninsula. The distinctions between these one-horned species are, in the first place, that *Unicornis* is much the larger, and secondly, that they inhabit different regions. Mr. Blyth was, beyond question, of all naturalists living at the time he wrote to me,* the best qualified to pronounce an authoritative opinion on the diagnostics of the two.

I am always reluctant to repeat a passage in the 'Zoologist,' even though, as in this instance, twelve years have intervened, yet as the subject is one of such great interest, and as the opportunity for comparison of the living animal has never before existed, I think I need not hesitate. Mr. Blyth, after quoting various authors and opinions, proceeds thus:—

"I must frankly confess that I have only quite recently discriminated the two one-horned species, fancying, as a matter of course, that the numerous skulls of single-horned rhinoceroses in the Society's Museum, from the Bengal Sundarbans, &c., especially the broad-faced type, were necessarily of the hitherto-reputed sole Indian species. F. Cuvier's figure of *R. sondaicus* is that of a very young animal, and, with those of Horsfield and S. Müller, conveys the appearance of a more evenly tessellated hide than I remember to have seen in any living continental example. I have, however, been comparing our stuffed Sundarbani example (less than half-grown) with the figure of the adult *R. indicus* in the 'Menagerie du Museum d'Histoire Naturelle,' and with the figures of *R. sondaicus* by S. Müller and others, and perceive that it must be referred to the latter and not to the former. The tubercles of the hide are much smaller than in *R. indicus*, and a marked difference between the two species, as

* His letter is dated Calcutta, March 1, 1862.

represented, consists in the great skinfold *at the setting on of the head* of *R. indicus*, which is at most but indicated in *R. sondaicus*. In skulls of adults, however those of both species may vary in width and especially in breadth anteriorly, the following distinctions are trenchant. Length of skull, from middle of occiput to tip of united nasals, in *R. indicus* 2 feet (half an inch more or less); in *R. sondaicus* $1\frac{3}{4}$ foot at most. Height of condyle of lower jaw in *R. indicus* 1 foot or even a trifle more; in *R. sondaicus* 9 inches. Breadth of bony interspace between the tusks of the lower jaw in *R. indicus* $1\frac{1}{2}$ inch to $1\frac{3}{4}$ inch; in *R. sondaicus* $\frac{3}{4}$ inch to 1 inch. These measurements are taken from exceedingly fine examples of both species."

Turning again to the 'Zoologist,' it is recorded by Mr. Arthur Adams, at p. 7328 of the volume for 1861, that at Mew Bay, in Java, near the Straits of Sunda, "the ground is literally ploughed up by the tracks of these unwieldy brutes." The brutes in question being beyond doubt this species, *Rhinoceros sondaicus*, no other species inhabiting that island.

I hope, if my life be spared a little longer, to revert to the specific distinctions of rhinoceroses again and again; for much remains to be investigated and satisfactorily explained; it is sufficient to hint a belief, prevalent in all countries where two-horned species occur, that they occasionally have three horns. I need scarcely say that I know of no preserved specimen having this peculiarity.

The specimen now in the Gardens is from Java, and I am told it has been purchased for the Society, at eight hundred pounds; it is deposited for the present in the first compartment of the elephant-house as you enter from the tunnel. I visited this animal on the 21st March, fourteen days after his arrival, and was particularly struck with the comparatively slender character of the head, which is much longer in proportion to its bulk than that of *Unicornis*. The skinfolds are of a less massive character and differ very considerably in outline and situation: there is particularly a saddle-shaped shield on the neck of *Sondaicus* of which I see no homologue in *Unicornis*; the back is thickly covered with brown bristle-like hairs; a fringe of similar hairs is also observable on the margin of the ear. The horn is little more than an apology, short and amorphous, as though the poor beast had been long in durance vile, and had worn away this instrument in its efforts to escape. The flattened tubercles, which in the hide of *Unicornis* have been compared to bolt-heads, are less, and less prominent on

the body, than in that species, but on the legs they are very distinct and strongly pronounced, although small; the tip of the upper lip is pointed and finger-like.

EDWARD NEWMAN.

Death of the Chimpanzee in the Zoological Gardens.—The chimpanzee, which during the last two and three-quarter years has been an endless source of instruction and amusement to visitors at the Zoological Gardens, after an illness of two months' duration, died on Friday, 6th March. The post-mortem examination showed that the cause of death was acute tuberculosis of the peritoneum, almost exclusively confined to the serous membrane covering the liver and spleen, the omentum and small intestine being slightly affected. A large bronchial gland was on the verge of suppuration, but the lungs were healthy. There were no symptoms of hectic during life, and much subcutaneous and omental fat were found after death.—*'Nature,'* March 12.

[Whether depressed by the loss of his friend, or affected by a like malady, the keeper, whose familiarity with the deceased must be fresh in the memories of my readers, has been ailing ever since.—*E. N.*]

Large Otter in the Isle of Wight.—A remarkably fine male otter was, I am informed by Mr. Smith, the Newport taxidermist, shot on the 7th of October last by Mr. John Mathews, of Alverstton, in the Yar, near Brading; it measured fifty inches in length, and weighed thirty-four pounds. What the ordinary weight of the otter may be I have not been able to ascertain; but Macgillivray says that the length of the male from nose to point of the tail is from thirty-two to thirty-eight inches, and some individuals measure nearly four feet. It would therefore appear that this otter is of unusual size. According to Pennant, the general length of the otter is thirty-nine inches. In the *'Dictionnaire Classique d'Histoire Naturelle'* the otter is said to be "deux pieds de long" (twenty-six inches, according to our measure)—a strange and unaccountable blunder. Though Buffon devotes no less than five pages to the history of the European otter, not a word is there said as to its size or weight, but he remarks, "elle ne va point à la mer:" a mistake, of course.—*Henry Hadfield; Ventnor, Isle of Wight, March 10, 1874.*

Golden Eagle at Powerscourt.—A golden eagle was shot at Powerscourt Waterfall about the beginning of February. It was a male, and had been observed about there for two or three years. Anton, the keeper, who shot the bird, says it was six feet ten inches from tip to tip of wings.—*R. M. Barrington; Fassaroe, Bray, Wicklow, March 20, 1874.*

Singular Capture of an Eagle.—As two men were engaged recently in repairing a house at Craighuanach, Lochaber, they observed a golden eagle on the ground, devouring what proved to be a rabbit. One of the men cautiously approached the bird, which was too intent in swallowing the carcase of the rabbit to notice his movements, and threw down a bundle of the brackens with which he was thatching the cottage on its back. A severe struggle ensued, but the two men, assisted by Mr. Macdonald, gamekeeper, managed to secure their prize, which proved to be a fine specimen, measuring seven feet from tip to tip, a size which is seldom equalled in the golden eagle.—*Inverness Advertiser.*

Kite at Nantygroes, near Presteign.—One of those very scarce birds, a kite, was shot a few days since on the Nantygroes estate by Mr. R. D. Green Price, who has placed it in the hands of Mr. Mellechamp, of this town (Presteign), for preservation.—*Hereford Journal, Jan. 17, 1874.*

Bluethroated Warbler at Chatteris, Cambridgeshire.—The first week in May last my two boys saw a bluethroated warbler in my garden: it ran across the gravel-path like a wagtail, for which they at first mistook it; but when it perched on a tree they at once saw it was a strange bird to them. Fortunately they had a good opportunity for observing it for ten or fifteen minutes. I was not at home, or the boys would have called me. Subjoined I give my eldest boy's description, which, I think, leaves little doubt as to species. "1st week in May, 1873.—A bird ran across the garden-path like a wagtail; it then flew into a bush peach tree; it had olive-brown back, like a robin's, but of a redder tint; sky-blue throat, with black line underneath, red patch on the lower part of the blue throat; underneath of body grayish. Song but little, something like a hedgesparrow's."—*Alfred Fryer; Chatteris, Cambridgeshire, March 7, 1874.*

Landrail in January.—A landrail was shot at Putley, near Ledbury, in this county, on the 30th of January, and was presented to Mr. L. Bird, of Malvern: a friend, who gave me the particulars, saw the bird, which was in good condition.—*J. B. Pilley; 2, High Town, Hereford, March 13, 1874.*

Heronry in Sussex.—Half a mile from Udimore is a well-known heronry. It lies at the bottom of a valley, and the herons that live about the marsh are accustomed to congregate there. In summer they are hidden by the foliage, but we were told that in the winter "the trees were white with them."—*L'Estrange's 'Thames to the Tamar,' 1873.*

Garganey Teal at the Land's End.—I saw three male garganeys just now at Mr. Vingoe's, in very perfect plumage, two of which he received at the Land's End and the other from the neighbourhood of Helston. They came with the sharp bit of frost we had in the early part of the week. The garganey never, to my knowledge, stops with us in the West during the winter months like the other wild species; they seem, in their equatorial movements in the autumnal season, to make the southern countries their

destination; nor do they remain here on their return northward in the spring to their breeding haunts, a few at distant periods, but with no certainty, alighting in our pools and wet marshes.—*Edward Hearle Rodd; Penzance, March 14, 1874.*

Note on the Changes of Plumage in Guillemots and Razorbills.—In Baron von Hügel's interesting paper on birds observed in Torbay (Zool. S. S. 3906), a suggestion is made that the changes of plumage in the razor-bill and foolish guillemot are not due to season, but to age. Having given in previous years some attention to this subject, I venture to state my belief that these changes are seasonal, but that they are more irregular, and, for the most part, commence much earlier than in other birds. A similar phenomenon occurs in the divers, and in the case of the great northern diver, it may, I think, be proved to be seasonal, as the lower mandible of this species becomes more gibbous when the bird is old than when it is young, and specimens are to be seen which, from this form of the bill, are evidently quite old birds in full winter dress. Some misapprehension also occasionally arises from the common use of the term "summer plumage" for that which is essentially the breeding dress, and would therefore be more appropriately termed the "spring plumage." I may add that I observe, by a mistake of the printer, Baron von Hügel's note on the scoter, in the paper above alluded to, has been erroneously divided into two paragraphs, the one headed "black ducks," the other headed "scoters."—*J. H. Gurney; March 2, 1874.*

Pairing of Birds.—It is well known that birds of some species pair for life; the raven, we know, is constant, and the rook, too, I have little doubt, having frequently observed them, even in mid-winter, flying in pairs and sitting side by side in their nesting-trees and about the old nests; but it is not generally supposed that many species do so, and it is a difficult point to decide, though I have been long of opinion that with several of our common birds the partnership is not invariably dissolved, of which I have had proof this winter, having seen many in pairs; for instance, the starling, blackbird, missel thrush, hedgesparrow, stonechat, wren, robin, &c. The cheering notes of many of our songsters were heard throughout the winter. January was quite spring-like; thermometer seldom below 50°, and on the 15th was up to 56° in the shade.—*Henry Hadfield.*

Economic Value of Alligators.—Perhaps many of your readers may not be aware that those large animals, the alligators, which infest every tropical river in America are now being applied to man's use. Bales of their skins are imported into France and Hamburg for the manufacture of large over-all boots.—*J. G. Mitchell; Southampton, February 23, 1873.*

Astroides calicularis of Milne-Edwards.—An extraordinary mass of this beautiful zoophyte has been received at the Crystal Palace Aquarium: the individual polypes are of a most brilliant orange colour, approaching vermilion: they were received from Naples.—*Edward Newman.*

Conclusion of the 'Entomologist's Annual.'—I feel sure that I am only giving expression to the opinion and sentiments of the universal "British entomologist," when I say that the announcement in the preface of the 'Entomologist's Annual for 1874' has filled me with grief and regret; its most worthy and able proprietor and editor asks *why*, as the 'Annual' must sooner or later come to an end, that end should not come *now*? Let me give, as an answer, this our reason—that its editor is, as I am glad to believe, still able to continue to the entomological world that which has been its annual boon for so many years; why, in full life and health and vigour, should the 'Annual' be put to death? I am no advocate for the dragging on of a weary and painful existence, a misery to self and a burden to one's friends. No! in such a case I would welcome the friendly *fiat* of annihilation; but surely the 'Annual's' existence is too full of life, and too dear to its friends either to merit or to welcome such a *fiat*. Surely the contemplated *felo-de-se* must be prevented. But perhaps Mr. Stainton only contemplates bringing forth the 'Annual' in a new shape? He possibly designs to rise Phoenix-like from his own ashes in a new and more resplendent form. I am supported in this idea by the mention in the preface of the word "series." "As this volume is the twentieth of its series, it seems a fitting opportunity to bring that series to its close." Good! we have had a most excellent and most successful series of twenty volumes; and to them, all golden and gay as they shine before me on my bookshelf, may there be added another, a "second series," of twenty more! But shall I deny it? there *was* an element of weakness in the constitution of the late 'Entomologist's Annual' that might well have brought about its decease at an even earlier date than the present. "De mortuis nil nisi bonum!" Still might not its decease have been averted if it had but admitted *spiders* into its pages? who can tell? We are told that rookeries will not flourish without an annual decimation by powder and shot; and so possibly the flies might have lived longer had the spiders come in to the rescue. Well, I can only say that in the event of a second series of the 'Entomologist's Annual,' the spiders shall not be wanting, as far as I may be able and permitted to furnish them. Joking apart, I trust that from all sides it will be impressed upon our excellent and able friend H. T. Stainton that the "British entomologist" expects him to do his duty, and to give us still yearly one of those welcome little volumes, which, though very neatly bound in shining golden cover, has by no means yet fallen into the "sere and yellow leaf."—*O. P. Cambridge; Bloxworth, February 19, 1874.*

Proceedings of Scientific Societies.

LINNEAN SOCIETY OF LONDON.

Feb. 5, 1874.—GEORGE BENTHAM, Esq., F.R.S., President, in the chair.
[No scientific business.]

February 19, 1874.—J. GWYN JEFFREYS, Esq., F.R.S., in the chair.

The following papers were read, *viz.* :—

1. "Systematic List of the Spiders at present known to inhabit Great Britain and Ireland." By the Rev. O. P. Cambridge. (Presented by Mr. H. T. Stainton.) During the last five years a constant communication and interchange of typical examples of spiders has been going on between Dr. T. Thorell, of Upsala, Dr. Koch, of Nürnberg, M. Eugène Simon, of Paris, the writer, and others, with a view to a determination of the synonymic identity of the species recorded as indigenous to Europe, but principally to Sweden, France, Germany and England. The results of this investigation have been published by Dr. Thorell in a most laborious and exhaustive work lately completed, 'On the Synonyms of European Spiders.' The effect of this work is to give priority to names of many British spiders described by Mr. Blackwall and the writer other than the names they bear in the works of those authors. The time therefore appears to have arrived when a list, complete to the present time, of the known spiders of Great Britain and Ireland under the names to which, according to the laws of priority, they appear to be entitled, seems to be a desideratum. Dr. Thorell, indeed (*Syn. Eur. Spid.* p. 471), gives a list of British spiders; but it is complete only to the date of Mr. Blackwall's work, 'Spiders of Great Britain and Ireland,' since the publication of which the number of known indigenous species has increased by nearly one-half. The systematic arrangement of Mr. Blackwall has not been adopted in this list, appearing, as it did, to be too artificial and based on insufficient (though in some respects convenient) characters, and, moreover, never to have found favour with other araneologists. The present arrangement (though it has no pretensions to finality) is the result of a long and tolerably careful study of spiders from many and widely different regions of the world. It begins at the opposite end to that where Dr. Thorell and Dr. Koch begin their systematic arrangements; but it is, in the main, not very discordant with that of the former of these authors, as put forth in his valuable work 'On the Genera of European Spiders,' a work to which the writer is indebted for many most valuable hints on the classification of the Araneidea.

2. "Some Observations on the Vegetable Productions and Rural Economy of the Province of Baghdad." By W. H. Colvill, Surgeon-Major H.M. Indian Forces, Civil Service, Baghdad. (Communicated by Dr. Hooker.)

3. "Note on the Bracts of Crucifers." By M. T. Masters, M.D. The subject was divided by the writer into two branches:—1. The absence of bracts in Crucifers. In the majority of cases this is so complete that even in the earliest stages of development observed by Payer no trace of bracts is seen. Different explanations of the phenomenon have been given by different morphologists. A. P. de Candolle attributes it to congenital suppression of the parts; Godron to pressure acting within outwards, resulting from the dense manner in which the young flowers are packed together; Norman and Eichler consider that the bracts are abortive, but potentially present, the latter writer combating Godron's view by the consideration that on the one hand the bracts are absent where the inflorescence is so loose that no pressure can be exerted, and, on the other hand, in some cases where the flowers are densely crowded the bracts nevertheless exist. 2. The occasional presence of bracts in Crucifers. About fifty illustrations of this were named. A few species, as *Sisymbrium supinum* and *hirsutum*, have normally bracts to every flower; in others their occurrence is only occasional; where the raceme shows a tendency to branch into a panicle, they may often be found at the base of the secondary divisions of the inflorescence; in *Arabis turrita* the lowermost peduncles have bracts at their base, the intermediate ones have bracts springing from their outer surface above their base, while the uppermost have none at all. The writer then discussed the various theories which have been proposed to account for the variation in the position of the bracts when present, *viz.* at the base or on the side of the flower-stalk above the base. The causes assigned for the latter apparently anomalous position were stated by different botanists to be the following:—1. Partition or subdivision of the axis; 2. Congenital union, or lack of separation between the bract and the pedicel; 3. Upraising of the bud and its bract. Anatomy gives no evidence of partition; but it does afford in some cases the evidence of fusion, or rather of inseparation, as in some of the *Cruciferae* examined by Dr. Masters; while in the case of *Sedum*, *Solanum* and *Spiræa* the peculiar arrangement of the bract seems to be owing to the third cause above mentioned.

Special General Meeting, March 5, 1874.—GEORGE BUSK, Esq., F.R.S., Vice-President, in the chair.

[No scientific business.]

Note.—In the report of the discussion which followed the reading of Mr. Gwyn Jeffreys's paper on January 15th, Dr. Allman is stated to have said that all the Hydroids collected by Captain St. John belonged "to types hitherto considered extinct;" it should have been "to forms hitherto undescribed."

ZOOLOGICAL SOCIETY OF LONDON.

Feb. 17, 1874.—GEORGE BUSK, Esq., F.R.S., Vice-President, in the chair.

Mr. Busk exhibited some skulls of the tiger and leopard from China, procured by Mr. R. Swinhoe, and showed that those from the Northern and Southern provinces did not appear to be specifically distinct.

A communication was read from Mr. L. Taczanowski, Conservator of the Museum of Warsaw, containing the descriptions of twenty-four new birds, obtained by Mr. Constantine Jelski in Central Peru. Amongst these was a new Cotingine form, proposed to be called *Dolyornis Selateri*, and four new humming-birds, named respectively *Metallura Hedvigæ*, *Helianthea dichroua*, *Eriocnemis sapphiropygia* and *Lamprastera Branickii*.

A communication was read from Sir Victor Brooke, Bart., describing a new species of gazelle, founded on two specimens living in the Society's menagerie, which he proposed to call *Gazella museatensis*.

A communication was read from Dr. T. Schomburgh, Director of the Botanic Gardens, Adelaide, containing an account of the habits of the Australian coote (*Fulica australis*) as observed in the Gardens under his charge.

Mr. E. Ward exhibited the head of a supposed new species of wild sheep, from Ladak, which he proposed to name *Ovis Brookei*, after Sir V. Brooke.

Dr. J. E. Gray communicated some notes on the crocodile of Madagascar, which he proposed to distinguish from *Crocodilus vulgaris* of Continental Africa, and to call *Crocodilus madagascariensis*.

A communication was read from Mr. W. N. Lockington, of Humboldt County, California, containing some notes on the mammals and birds met with in that part of the State of California.

March 3, 1874.—Dr. E. HAMILTON, Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's menagerie during the month of February, 1874, and called special attention to a Malayan hornbill (*Buceros malayanus*) new to the Society's collection, acquired by purchase; a python, presented by Mr. J. C. Noble, of Hong Kong, having been captured in his garden on the Chinese Mainland, and a young male of an undescribed species of deer from Northern China.

A letter was read from Sir Henry Barkly, Governor of the Cape Colony, announcing that he had obtained a pair of young eared seals (*Otaria pusilla*) for the Society's collection.

A communication was read from Mr. W. H. Hudson, of Buenos Ayres, describing the parasitical habits of the three species of *Melothrus*, found in Buenos Ayres, namely, *M. bonariensis*, *M. badius* and *M. rufo-axillaris*.

Mr. Selater read an account of a small collection of birds, obtained by Sir Graham Briggs in the island of Barbadoes, West Indies.

A second paper by Mr. Selater contained the description of an apparently

new form of the family Icteridæ, which he proposed to call *Centropsar mirus*.

A communication was read from Dr. J. E. Gray containing some remarks on *Crocodylus Johnsonii*, *Kreff*, from Northern Australia, of which he proposed to form a new genus *Phylas*.

Mr. W. Saville Kent read a paper on a huge cephalopod or cuttle-fish, announced by the Rev. M. Harvey as lately encountered in Conception Bay, Newfoundland, and of which a tentacle sixteen feet long has been secured for the St. John's Museum. Mr. Saville Kent contributed the additional evidence of an arm nine feet long preserved in the British Museum, in proof of the gigantic dimensions occasionally attained by certain members of this order of the Mollusca, and proposed to institute the new generic title of *Megaloteuthis* for their especial reception; he further suggested distinguishing the Newfoundland example as *Megaloteuthis Harveyi*, in recognition of the services to Science rendered by Mr. Harvey, in his record of and steps taken to preserve so valuable a trophy.

March 17, 1874.—Prof. NEWTON, F.R.S., Vice-President, in the chair.

The Secretary called the attention of the meeting to an important addition that had been made to the Society's collection on the 7th inst., by the acquisition of a young male Javan rhinoceros (*Rhinoceros sondaicus*) from Batavia, believed to be the first example of this rhinoceros that had ever been brought alive to Europe.

A letter was read from the Rev. S. J. Whitmee, resident at Samoa, stating that he had forwarded, through Dr. G. Bennett, of Sydney, a *Didunculus* and two curlews for the Society's collection, and giving interesting particulars concerning the habits of this bird, and another peculiar Samoan species—*Pareudiastes pacificus*.

An extract was read from a letter addressed to the Secretary by Dr. George Bennett respecting a *Didunculus*, and other birds, he had received from the Rev. Mr. Whitmee, of Samoa, intended for the Society's collection.

Dr. Günther gave some details concerning the recent introduction into this country, by Lord Arthur Russell, of the ide (*Leuciscus melanotus*, var. *orfus*).

Prof. Huxley read a memoir upon the structure of the skull and of the heart of *Menobranchius lateralis*, describing the structure of the bony skull in the osteo-cranium, and giving a full account of the primordial skull or chondro-cranium, which has not hitherto been noticed. The chondro-cranium was compared with that of *Proteus*, and that of larval frogs and tritons, and its essentially embryonic character was indicated. The chondro-cranium was further shown to be formed by the coalescence of three distinct classes of elements, which were termed "parachordal," "pleural" and "paraneural." The heart was described, and the septum of the auricles was

shown to be an open net-work allowing of free communication between the right and left auricular chambers. The structure of the truncus arteriosus was compared with that observed in other amphibians.

Mr. R. B. Sharpe communicated the descriptions of two new species of birds recently procured by Mr. H. T. Ausell, of Gaboon; these were proposed to be called *Centropus Anseli* and *Dryoscopus coronatus*.

ENTOMOLOGICAL SOCIETY OF LONDON.

February 16, 1874.—Sir SIDNEY SMITH SAUNDERS, C.M.G., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—‘Proceedings of the Royal Society,’ no. 149; presented by the Society. ‘Annales de la Société Entomologique de Belgique,’ tome xvi.; by the Society. ‘Entomological Contributions,’ by J. A. Lintner; by the Author. ‘L’Abeille, 1874,’ 4e livr.; by the Editor. ‘The Entomologist’s Annual for 1874;’ by H. T. Stainton, Esq. ‘Additions au Synopsis des Cordulines,’ par M. Edm. de Selys-Longchamps; by the Author. ‘Description of a New Genus and Species of Papilionidæ from the South-Eastern Himalayas,’ by W. S. Atkinson, M.A., F.L.S., &c.; by the Author.

Election of Members.

Edward A. Fitch, Esq., of Down Hall, Rayleigh; A. Dowsett, Esq., of 16, North-street, Brighton; and James Wood-Mason, Esq., Curator of the Indian Museum of Calcutta, were respectively balloted for and elected Members of the Society.

Exhibitions, &c.

Mr. Weir exhibited a sample of wheat from Australia which was infested with the weevil, *Sitophilus oryzae*, the cargo being so much damaged that about two tons were utterly useless. The weevil was accompanied by *Læmophloeus ferrugineus*. He also showed specimens of *Sitophilus granarius* and *Rhizopertha pusilla* infesting wheat from Japan.

Mr. Higgins exhibited a collection of Cetoniidæ from the Philippine Islands, which had been described by Dr. Mohnike. The collection comprised the following species, with others:—

Phædimus Jagori, <i>Gerstäck.</i> , female?	Euglypta attenuata, <i>Mohnike.</i>
Coryphocera simillima, <i>Mohnike.</i>	„ biplagiata, „
„ purpurea, „	Cetonia papalis, „
Clinteria formosa, „	„ leucogramma, „
Agestrata Semperi, „	„ purpurisata, „
Macronota propinqua, „	„ Boholica, „
Glycyphana pulcherrima, „	„ tenuicollis, „

Mr. Higgins was of opinion that unless the male of *Phædimus Jagori* differed from the male of *P. Cumingi*, then the so-called female was only a *var.* of *P. Cumingi*. He also thought that thirty-five or thirty-six out of the forty-two species would in all probability stand good, but that the others would prove to be simply varieties of previously known species. He considered the figures in Mohnike's '*Cetoniden der Philippinischen Inseln*' were so bad as to be unrecognisable, they being wrong in colour and markings.

Mr. Higgins also exhibited specimens of *Diaphonia Digglesii*, *O. Janson*, and *Schizorrhina palmata*, *Schaum*, from Australia.

Mr. F. Smith exhibited (1) a hermaphrodite ant, *Myrmica lævinodis*, captured by Mr. J. Chappel, at Dunham Park, Cheshire: this insect is figured and described in the '*Entomologist's Annual for 1874*;' it combines characters of male, female and worker. (2) Specimens of *Coluocera Attæ*, *Kraatz*, described in '*Berliner Entomologische Zeitschrift, 1858*,' found by Mr. J. Traherne Moggridge, at Mentone, in the seed-magazines of *Aphænogaster (Atta) structor*. With reference to the latter Mr. Moggridge writes as follows:—

"I have lately been exploring a very large and far-spreading nest of *Atta structor*, and I find in the abundantly-filled granaries great numbers of the small beetle which I enclose. *Platyarthrus* is also very common in the nests. I have never observed this beetle elsewhere, and I do not think it would have escaped me if it had been at all abundant in the nests of *Atta barbara*. I have opened but few nests of *A. structor*, owing to their being usually placed either in terrace-walls or in garden-ground. I spend a great deal of my time now in digging for seeds in ants' nests, as I want these seeds for the experiments I am making in the hope of learning the secret method by which the ants render their seeds dormant at will in damp soil. I am much struck by the frequent occurrence of the nests of trap-door spiders in the very soil of the ants' nests, the spider's tubes often running quite close to, and in the midst of, the galleries of the ants. Ants certainly form a large part of the food of trap-door spiders, and this helps me to understand how it comes that the spiders can get a living without leaving their nests. The spider sits watching at the mouth of her tube, with the door raised very slightly, and then snatches in any insect that may chance to pass within reach."

The Secretary read some remarks taken from the '*Times*' and '*Gardener's Magazine*' on the rapid progress of the Colorado potato beetle (*Doryphora decemlineata*) through the United States and Canada, and the remedy of Paris green, which was stated to have been used with success by the farmers in Canada. The fifteen-spotted ladybird was mentioned as a powerful enemy to the potato-beetle, devouring it in the larva-state. The writer in the '*Times*' suggested the encouragement of small birds as the

best security against the pest; but, as it had been stated that the insects when crushed produced blisters on the skin, whenever they came in contact, and if they touched a wound caused severe inflammation and painful ulcers, Mr. Bates expressed a doubt as to whether the small birds would care to meddle with them. It was, however, a matter deserving of serious consideration, and any practical suggestions for the destruction of the insect would be desirable.

March 2, 1874.—Sir SIDNEY SMITH SAUNDERS, C.M.G., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—‘The Journal of the Linnean Society,’ no. 57; presented by the Society. ‘Bulletin de la Société Linnéenne de Normandie,’ 2e Sér., t. vi.; by the Society. ‘Bullettino della Società Entomologica Italiana,’ t. v., trim. 4; by the Society. ‘The Canadian Entomologist,’ vol. vi. no. 1; by the Editor. ‘Newman’s Entomologist’ and the ‘Zoologist’ for March; by the Editor. ‘The Entomologist’s Monthly Magazine’ for March; by the Editors. ‘L’Abeille, 1874,’ 6c livr.; by the Editor. ‘A Synonymic List of British Lepidoptera,’ by Henry Doubleday, Second Edition, with Supplement, 1873; by J. W. Dunning, Esq.

Exhibitions, &c.

Mr. McLachlan exhibited two male examples of an Orthopterous insect belonging to the family Locustidæ, which had been placed in his hands by Mr. Daniel Hanbury, who received them some years since from his brother at Shanghai. It appeared from Mr. Hanbury’s statements that these insects were sold in the streets of Shanghai, confined in little ornamental wicker cages, and bought for the sound they produced. The species appeared to be undescribed, and to pertain to a new genus, somewhat allied to Xiphidium. The President remarked that in Turkey a kind of cricket was kept in a similar manner in paper cages and fed upon lettuce-leaves.

Mr. McLachlan also exhibited a series of examples illustrating the natural history of *Oniscigaster Wakefieldi* from New Zealand, described and figured by him from the female imago, in the ‘Entomologist’s Monthly Magazine,’ x. pp. 108—110 (October, 1873). He had now received from Mr. Wakefield a second series of specimens, including the male imago, female sub-imago, adult nymph and larva. The lateral wing-like horny expansions of the terminal segments of the abdomen in the imago and sub-imago are continued in the aquatic conditions on each segment of the abdomen, and in addition there are similar formations along the back of the abdomen placed longitudinally and vertically.

Mr. M'Lachlan further remarked that in the Bulletin of the Proceedings of the French Entomological Society, at the Séance of the 28th January last, M. Guenée avowed himself much puzzled concerning the supposed aquatic larva producing a species of moth, described by M. Bar as *Palustra Laboulbenei*, which he considered was allied to the genus *Cnethocampa*. He thought further information very desirable, for all the characters of the insect were opposed to aquatic habits in any stage; and he suggested that the bubbles of air entangled in the hairs might be only expired air.

The Rev. A. E. Eaton exhibited a few Arctic insects which he had brought from Spitsbergen. Amongst others were a Trichopterous insect, probably *Goniotauius arcticus*, *Boheman*; and also some Lepidoptera, *Plutella cruciferarum*, the larva of which feeds on a species of *Draba* and a species of *Phycita*, near to *sub-ornatella*. They were mostly collected on the higher parts of the hills, where there was a very small amount of vegetation. He also exhibited several excellent photographs, illustrative of the scenery of those desolate regions; and pointed out some depressions in the ground where patches of stunted willows grew, from which he obtained specimens of a kind of sawfly.

Mr. Champion exhibited a specimen of *Cassida vittata* taken by Mr. Walker near Chatham. The red colour was of peculiar brilliancy when alive, though its brightness had since somewhat faded.

A further communication was received from Mr. J. V. Gooch respecting the injury to the coffee trees in Natal from the Longicorn beetle, *Anthores leuconotus*, *Pascoe*. Mr. Gooch remarked that he was disposed to think that the plants were suffering from fungus before they were attacked by the insect, and stated that the ground into which the coffee-plants had been put contained a large number of decaying roots of the trees which formerly stood there for ages; and that when cleared for planting with coffee, these roots were carelessly left in the ground, though, at the time, there was no idea in the minds of the planters as to any injury being likely to arise from them. He had drawn his son's attention to this point, and he hoped before long to obtain some information which might prove of interest to the Society, and which he would not fail to communicate to them.

Papers read.

"On some New Species of South-African *Lycænidæ*." By Roland Trimen, F.L.S.

"Descriptions of New Species of *Lycænidæ*," from his own Collection. By W. C. Hewitson, F.L.S., F.Z.S.

New Parts of 'Transactions.'

Part V. of the 'Transactions' for 1873, concluding the volume, was on the table; and also Part I. of the 'Transactions' for 1874.

March 16, 1874.—Sir SIDNEY SMITH SAUNDERS, C.M.G., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—‘Proceedings of the Boston Society of Natural History,’ vol. xiv., nos. 15—27; vol. xv., parts, 1 and 2; presented by the Society. ‘Bulletin of the Buffalo Society of Natural Sciences,’ nos. 2 and 3; by the Society. ‘On the Carboniferous Myriapods preserved in the Sigillarian stumps of Nova Scotia,’ by Samuel H. Scudder; by the Author.

Exhibitions, &c.

Mr. Champion exhibited specimens of *Euryporus picipes* taken near Chatham, by Mr. Walker.

Mr. Edward Saunders exhibited a box of Buprestidæ from the Philippine Islands, collected by Dr. Semper.

Mr. Smith directed attention to an article in ‘Household Words’ of 30th December, 1855, in which a description was given of the ravages of locusts, and stating that the locusts devoured woollen materials and leather, a fact of which he was not hitherto aware.

At the request of Dr. Sharp, the Secretary read the following note:—

“I find that in his Address at the recent Anniversary Meeting of the Society, the late President noticed a pamphlet recently published on the subject of Zoological Nomenclature.

“In this notice the President states that Dr. Sharp proposes to have ‘three names for each species.’ This statement, however, does not only not represent what I propose, but is calculated to convey such a misconception about my propositions, that I do not think it would be right to allow it to pass without observation from me.

“So far from having ‘three names for each species,’ it is my object to have but one name for each species. I do not consider it desirable that the classificatory name shall be used at all as a part of the name of a species. And the main object of the pamphlet noted by the learned President is to facilitate the complete separation of species nomenclature from classification nomenclature. Till this object be attained there can be no solution of the nomenclature question; and the only way of obtaining it is either to establish a separate mononymic system of species names, or to adopt the compromise proposed by me.”

Papers read.

“Notes on a Collection of Buprestidæ from the Philippine Islands, with Descriptions of New Species.” By Edward Saunders, F.L.S.

“Illustrations of several additional Species of Lucanidæ in the Collection of Major F. J. Sidney Parry.” By J. O. Westwood, M.A., F.L.S., &c.—*F. G.*

Notices of New Books.

Researches in Zoology, illustrative of the Structure, Habits and Economy of Animals. By JOHN BLACKWALL, F.L.S. Second Edition. Demy 8vo, 345 pp. letterpress, two outline plates. London: Van Voorst. 1873.

“An accurate and comprehensive history of the Periodical Birds may now be considered one of the greatest desiderata in Ornithology. Hitherto little has been done to elucidate the manners and economy of this interesting portion of the feathered tribes, as connected with their periodical appearance and disappearance; for although much has been written on the subject, yet few facts of any considerable importance have been ascertained; and even those few lie scattered through the writings of such various authors, and are so blended with what is erroneous, or merely conjectural, that it is no easy task to distinguish and collect them; consequently our knowledge of the circumstances which regulate the motions of the numerous species of Periodical Birds is still very imperfect, and we are almost entirely ignorant of the places of their retreat, and of the mode of their existence in those retreats. Whether, when they withdraw, they depart from those districts and countries in which they cease to appear, or *whether they conceal themselves and remain in a state of torpidity, has not yet been positively determined; and opinions must continue to be divided on the subject* so long as authors indulge in fanciful speculations, instead of collecting and arranging well-authenticated facts, from which alone legitimate conclusions can be deduced.”—Page 1.

In giving this as a *verbatim* and *literatim* copy of Mr. Blackwall's opening paragraph, it is important I should state explicitly that the *italics* are my own, and are introduced for the purpose of bringing prominently to notice the exact amount of knowledge, or rather of ignorance, that prevailed in 1834 respecting the migratory habits of our birds, as acknowledged by one of our most distinguished teachers of the science. From such an one it appears a curious confession that “we are almost entirely ignorant of the places to which birds retreat in their migrations,” for in 1873 we know, or think we know, the retreat of each migratory species as accurately as we learn from ‘Bradshaw’ the station at which the mail train to Edinburgh is advertised to stop: it is therefore with infinite astonishment that we read without any modification or emendation,

that "we are almost entirely ignorant of their places of retreat." Then again, with regard to the doubt whether birds "conceal themselves and remain in a state of torpidity," is it possible that even a doubt can be entertained?

In the brief preface to this Second Edition, dated 22nd August, 1872, we are told that "the descriptions of the British spiders are omitted, as they are all included in 'A History of the Spiders of Great Britain and Ireland;'" but the author adds, "I may remark that the materials of which the present volume is composed have been collected for the most part during intervals of relaxation from more important avocations; and it is hoped that they may be found to contain information on various subjects interesting to the general reader and to the natural philosopher." Not one word is said of the author entertaining a doubt of his preliminary statement as quoted above.

When I began the pursuit of Natural History I heard every one who possessed a similar proclivity speaking of Mr. Blackwall "with bated breath," and regarding him as one whose vast knowledge of Natural History removed him entirely out of the category of living and working naturalists, as one who should be regarded rather as a superior being, a sort of inspired teacher, than as a humble and erring fellow-labourer and fellow-student of Nature's doings. His writings were considered far too profound for common capacities, and were only permitted to see the light through the instrumentality of hot-pressed quartos or technical octavos, which, by their very tone and phraseology, were hermetically sealed against all but the elect. When, therefore, I received this volume, and for the first time Mr. Blackwall stood before me, as he describes himself in the paragraph I have quoted, I experienced a shock that I can scarcely describe. Still I shall be able to make some extracts showing that as an observer he is not without merit; but before doing so I think it may be allowable to notice an anachronism continually occurring which requires explanation.

In the "Inquiry into the Supposed Capability of the Periodical Birds to become Torpid," are cited observations made in 1816, 1824, 1826, 1827, 1842, 1843 and 1855, those of the last year containing a rowed extracts from the Report of the Twenty-fifth Meeting of the British Association, and yet these are repeated in 1873 as portion of a Second Edition of the 'Researches in Zoology,' published in 1834. This confusion is of

course due to the fact of the author having mended the old garment with pieces of new cloth, and when this process of mending had been completed, ignoring the new patches in his preface, but making his strictures on our ignorance apply alike to the old and to the new.

The cuckoo is a bird of such general and absorbing interest that we are glad of every scrap of information respecting it. I am aware it is treacherous ground to enter on, but he who hesitates to diffuse either fact or theory, in the fear of displeasing the captious, or the prejudiced, is unworthy to hold an Editor's pen. The third and fourth chapters, treating exclusively on the cuckoo, are chiefly in reference to what is published in Montagu's 'Ornithological Dictionary,' but incorporating original and characteristic observations. Thus, after mentioning the extraordinary fact related by Dr. Jenner, of two hedgesparrow's eggs containing living fœtuses having been found under a young cuckoo about a fortnight old, and Colonel Montagu's conjecture that, contrary to the case in the generality of birds, cuckoos have the power of retaining the egg in the ruterus after it is perfected, and that while there the embryo is progressively advanced towards maturity by the internal heat of the parent's body, Mr. Blackwall adds—

“Now without having observed a single circumstance in the whole course of my inquiries which at all tends to corroborate this opinion of Montagu's, I have discovered a curious fact which appears to render such a supposition altogether unnecessary. On the 5th of May, 1822, I saw a cuckoo in the act of watching a pair of titlarks construct their nest. The larks had just commenced building, and did not seem to be at all disconcerted at the presence of the cuckoo, which sat on the ground, about seven or eight yards from the spot, attentively observing them, and when disturbed flew away with great reluctance, and only to a short distance. This nest, which was on Kersal Moor, where the races are annually held, was too distant from my residence to permit me to examine it frequently, and to make such numerous and minute observations as I wished; but on the 12th of May I again visited it, in the confident expectation that it would contain a cuckoo's egg, and I was not disappointed. I may further remark, in confirmation of this discovery, which, by exhibiting a curious and hitherto unnoticed instinctive propensity of this bird, forms an interesting addition to its history, that cuckoos almost invariably deposit their eggs in the nests of other birds as soon as those birds begin to lay—not unfrequently, indeed, immediately after the exclusion of the first egg; and Mr. Baker informs me that he saw the hen of that pair of cuckoos which he observed so closely

last spring fly directly to a titlark's nest as to a place with which she was perfectly familiar, though he had never seen her there before; and after raising her head and looking round, as if to ascertain whether she was noticed or not, she went and deposited her egg in the nest before the lark began to lay. From these circumstances, and from the direct evidence of my own senses, I consider this fact, then, as satisfactorily established; and it is of importance, inasmuch as it completely obviates a difficulty which has greatly perplexed modern ornithologists, and which chiefly induced Colonel Montagu to form his extraordinary but gratuitous opinion respecting the power of the cuckoo to retain its egg till it meets with a nest in a suitable state to receive it."—P. 61.

A great deal has been written to show that other birds in addition to the actual foster-parents assist in the commisariat of the young cuckoo; the statements, although marvellous, seem well authenticated, and have therefore been accepted as good Natural History. Mr. Blackwall attributes this benevolent action to the influence of the cry for food, which is always heard when we approach a nest; it would appear that the language is universally understood among parent-birds—a theory that renders the following passage peculiarly interesting:—

"I have been favoured with a communication from Mr. Eaton, of York, which places the subject under consideration in a somewhat different light from that in which it has been viewed by any preceding ornithologist. Mr. Eaton informs me that in the summer of 1827 Captain Porter, who resides near the city of York, discovered a hedge warbler's nest in his garden containing a young cuckoo only, the nestling hedge warblers, all of which had been ejected by this formidable intruder, being found dead near the spot. The nest and its occupant were taken by the Captain and put into a cage, which was placed on the summit of a pole in the garden. In this situation the foster-parents speedily visited their captive charge, and, resuming their attentions, continued to feed it with great assiduity; but their most strenuous exertions failing to satisfy its increasing voracity, a third hedge warbler was induced to co-operate with them in their arduous undertaking. As the young cuckoo advanced in growth a still more ample provision of food became requisite, and a spotted flycatcher lent its assistance also in supplying the urgent demands of its appetite. It may be here remarked that the purpose of these birds in visiting the young cuckoo, from the numerous observations which were made upon them, and the favourableness of the situation and circumstances for ensuring accuracy, could not be mistaken. I shall now proceed to notice the most novel and important fact detailed in Mr. Eaton's interesting narrative—namely, the

assistance afforded by the spotted flycatcher. 'How,' Mr. Eaton inquires, 'could a pair of hedge warblers prevail upon a bird of a different species to contribute to the support of their suppositious offspring?' Were the case as the question necessarily supposes it to have been, it certainly would present a great difficulty; for the feathered tribes, though capable in some instances of connecting vocal sounds with the ideas intended to be signified by them, do not possess an artificial language; but I am inclined to think that the hedge warbler did not intentionally exercise any influence whatever over their coadjutor. Nestling cuckoos, it is well known, are extremely clamorous when powerfully stimulated by hunger; indeed their cry for food is so incessantly repeated on such occasions that it frequently leads to their discovery. Now this, I believe, is the exciting cause, which, by calling into operation the parental affections of birds so circumstanced as to be influenced by it, impels them to succour the young of strangers, even when they have not been placed under their immediate care; and the most probable reason which suggests itself why so many individuals of a kind are sometimes associated together in the performance of the same task, is that they are attracted by each other's calls. The following anecdotes support these opinions:—A nestling greenfinch was placed in the same cage with an adult lesser redpoll, which brought it up with the utmost care. Several young sparrows, whose nest had been destroyed, were put into a small basket by a lady who pitied their helpless condition, and the basket was then conveyed to the grass-plot in front of her house. In this situation they soon became clamorous for food, and a great variety of birds hastened to the spot, many of which were observed to supply them with nourishment; but unfortunately they soon perished, probably from a deficiency of warmth, as they had not been hatched many days and were almost destitute of covering. The sons of Mr. Lord, of Ramsey, Essex, took four young ravens from a nest and put them into a waggon in a cart-shed. About the same time they destroyed the young of a magpie which had its nest near the cart-shed; and the old magpies, hearing the young ravens crying for food, carried them some, and constantly fed them till they were disposed of by the boys."—P. 76.

Another observation, tending to show that small birds do sometimes object to the hen cuckoo's making their nest a nursery for her child, is well worth quoting.

"On the evening of the 24th of June, 1814, I saw a hen cuckoo alight in a field of mowing grass, when a pair of titlarks attacked it with such fury that they pulled several small feathers off it. Their loud cries and violent gesticulations attracted the notice of several people at work near the spot, who, by throwing stones at the cuckoo, drove it to some distance; however, it soon returned, and, though repeatedly annoyed, persevered till it ultimately accomplished its purpose by laying in the nest of the larks."—P. 66.

On the following page is a memorandum serving entirely to corroborate Dr. Jenner's account of the manner in which the young cuckoo ejects its foster-brothers and sisters: this is the more valuable, because certain subsequent naturalists have expressed great doubts as to Dr. Jenner's accuracy, and consequently as to the ability of the young cuckoo to perform such an athletic feat.

"On the 30th of June, 1823, I took a young cuckoo, which was hatched in a titlark's nest, on White Moss, on the 28th, seven days after the old birds had quitted that neighbourhood; and this nestling, while in my possession, afforded me an opportunity of contemplating at leisure the entire process of ejecting young birds and eggs from the nest, so minutely and accurately described by Dr. Jenner. I observed that this bird, though so young, threw itself backwards with considerable force when anything touched it unexpectedly. It died on the 2nd of July, the fifth day after it was hatched, and then weighed 318 grains."—P. 67.

Mr. Gould is one of the sceptics to whom I have alluded, but that eminent ornithologist has recently found abundant reason for altering his opinion. The incident narrated below was communicated to Mr. Gould, and was published by him in the 'Introduction to the Birds of Great Britain,' together with an illustration exhibiting the young cuckoo in the very act of ejecting a titlark from its birth-place: the narrative as well as the illustration are reproduced in the 'Field' of November 22nd, in a paper by Mr. Harting, from which I have extracted the following most interesting paragraphs, from the pen of Mrs. Blackburn, an eye-witness of the proceeding.

"The nest which we watched last June, after finding the cuckoo's egg in it, was that of the common meadow pipit (titlark, moss cheeper), and had two pipit's eggs, besides that of the cuckoo. It was below a heather-bush, on the declivity of a low abrupt bank, on a Highland hill-side, in Moidart. At one visit the pipits were found to be hatched, but not the cuckoo. At the next visit, which was after an interval of forty-eight hours, we found the young cuckoo alone in the nest, and both the young pipits lying on the bank, about ten inches from the margin of the nest, but quite lively after being warmed in the hand. They were replaced in the nest beside the cuckoo, which struggled about till it got its back under one of them, when it climbed backwards directly up the open side of the nest, and hitched the pipit from its back on to the edge. It then stood quite upright on its legs, which were straddled wide apart, with the claws firmly fixed half-way down the inside of the nest, among the interlacing fibres of which

the nest was woven; and, stretching its wings apart and backwards, it elbowed the pipit fairly over the margin so far that its struggles took it down the bank instead of back into the nest. After this the cuckoo stood a minute or two, feeling back with its wings, as if to make sure that the pipit was fairly overboard, and then subsided into the bottom of the nest.

“As it was getting late, and the cuckoo did not immediately set to work on the other nestling, I replaced the ejected one and went home. On returning next day both nestlings were found dead and cold, out of the nest. I replaced one of them, but the cuckoo made no effort to get under and eject it, but settled itself contentedly on the top of it. All this I find accords accurately with Jenner’s description of what he saw. But what struck me most was this: the cuckoo was perfectly naked, without a vestige of a feather, or even a hint of future feathers; its eyes were not yet opened, and its neck seemed too weak to support the weight of its head. The pipits had well-developed quills on the wings and back, and had bright eyes, partially open; yet they seemed quite helpless under the manipulations of the cuckoo, which looked a much less developed creature. The cuckoo’s legs, however, seemed very muscular; and it appeared to feel about with its wings, which were absolutely featherless, as with hands, the ‘spurious wing’ (unusually large in proportion) looking like a spread-out thumb. The most singular thing of all was the direct purpose with which the blind little monster made for the open side of the nest, the only part where it could throw its burthen down the bank.”

The whitish spaces at the base of the rook’s beak attracted Mr. Blackwall’s attention, as it has done that of every other ornithologist, and he is not the only writer who has argued in favour of both the popular solutions of this phenomenon. In my editorial capacity I have been compelled to read all that has been written on this phenomenon, and, I fear, with small profit: perhaps the suggestion of Mr. Knox that the specific name of the rook should be altered from *Frugilegus* to *fodiens* may by some be regarded as settling the question, but I confess that to me it was not perfectly satisfactory. An incident occurred within my own knowledge. I was assured that a gentleman had three rooks brought up from the nest which were perfectly without this rook characteristic. I visited the rooks in question, and found them in fine condition and resplendent in glossy plumage, and decently clothed with feathers about the beak; in fact, they possessed every character of the carrion crow. On inquiring I found that a keeper had taken the nest at or near Eltham, and the owner of the birds could assign no satisfactory reason for considering them rooks

at all. Here are both Mr. Blackwall's opinions as recorded by himself:—

“In the year 1834 I advocated the opinion prevalent among ornithologists, that the loss of the feathers alluded to above is attributable to the habit which the rook has of thrusting its bill into the ground in search of food. An extensive examination and comparison of specimens had led me to observe that the nudity extends further and is more complete in some individuals than in others, that the more prominent and exposed parts are first deprived of feathers, and that short filiform processes bearing a close resemblance to new feathers enveloped in membrane, frequently occur on the less prominent and less exposed parts, particularly on the flaccid skin which occupies the angle at the base of the lower mandible. In addition to these facts, I may remark that an opportunity had presented itself of inspecting a rook whose mandibles were so greatly curved in opposite directions, and consequently so much crossed at the extremities, that it could not possibly thrust its bill into the ground; and the base of that organ and the anterior part of the head did not manifest the least deficiency of plumage. With such evidence in its favour, I was induced to adopt the popular hypothesis, which I now abandon in consequence of having recently proved by experiment that it is erroneous.

“Being supplied by Mr. Davies with two young rooks taken from a nest in his rookery at Cyffdry on the 17th May, 1843, I put them into a large wooden chicken-pen, purposing, when they could take food without assistance, to remove one of them to a garden enclosed with walls, where it might have an opportunity of employing the means of procuring sustenance common to the species, and let the other remain in the pen. This plan was frustrated by the unexpected death of one of the young birds soon after it came into my possession; but the result of the experiment, as will be seen in the sequel, was not at all affected by this untoward circumstance. In the month of August the surviving rook lost only a few feathers from various parts of its body, but did not moult regularly till July and August, 1844, when the feathers at the base of the bill and on the anterior region of the head were cast off and were not renewed, though the bird was remarkably healthy, and was never on any occasion suffered to leave the pen for a moment. On the 20th June, 1846, an unfortunate accident terminated its existence. It lived long enough, however, thoroughly to establish the fact that after the feathers are once shed from those parts in the act of moulting they are not renewed, as the denudation became rather more extensive and complete after the bird had moulted a second time, in the summer of 1845, and continued unchanged to the day of his death, affording a convincing proof that this conspicuous feature in the adult rook, which strikingly affects its physiognomical expression, must be regarded as a specific character.”—P. 160.

I shall conclude these extracts with one which is justly intitled "a remarkable physiological fact"—indeed so remarkable is it that I should fear to reprint it, but that the onus will rest on other shoulders. I could certainly have wished that Mr. Blackwall had entered more into detail, that he had given us particulars of the first association of three animals so different in their natures, and assigned some possible, if not plausible, reason for the unprecedented occurrence; however, I must leave all surmises to my readers. I have confidence in the good faith of the narrator, although I suspect the story is susceptible of some explanation which does not appear.

"A spaniel bitch belonging to Mr. Robert Scholes, of Cheetham Hill, near Manchester, in the autumn of the year 1830, brought up a kitten and a fawn of the fallow deer, which she attended to as assiduously as if they had been her own offspring. Instances of animals, when deprived of their young, attaching themselves to the progeny of other species endowed with physical and mental powers differing widely from their own are of frequent occurrence; and the warmth of affection usually manifested towards the nurselings on such occasions proves how deeply the parental feelings are implanted in the inferior orders of animated beings. I have known the domestic cat, for example, take charge of young squirrels and young hares, which, but for the powerful influence of this active principle, would in all probability have fallen victims to feline voracity. But what renders the case before us peculiarly interesting to the physiologist is the fact that the bitch was only fourteen months old and never had whelps; it is reasonable to suppose, therefore, that the secretion of milk in her teats was promoted by the excitation induced by the repeated efforts of the kitten and fawn to derive sustenance from that source. The fawn increased in growth so rapidly that it soon greatly exceeded its foster-mother in stature."—P. 205.

I cannot close the volume without expressing my conviction that it never should have been published in its present form; containing as it does many passages of great interest, these ought to have been arranged with greater care, and such paragraphs as that I have cited at the head of this notice should have been wholly eliminated, as entirely misrepresenting the present state of our knowledge, and unworthy of the reputation the author's other writings have attained.

EDWARD NEWMAN.

Official Handbook to the Collection of Animals of the Wurtemberg Stuffed Animals Company (Limited). 1873.

THE best way of introducing this Handbook to the readers of the 'Zoologist' is by reprinting the author's account of his own labours and of the Collection on which those labours have been expended.

"The animals enumerated in the following Catalogue have been all prepared by Herr Ploucquet, of Stuttgart, whose skill in modelling and mounting preparations in Natural History will be remembered by every one who visited the International Exhibition of 1851 in Hyde Park. Since that time the Collection has been very largely increased, and many of the more recently made groups give evidence of still further advance in the art which obtained for Herr Ploucquet so distinguished a fame in England, twenty years ago. His Collection has been packed and sent over under his own personal superintendence, and is being remounted and arranged by his brother naturalist, Herr Müller (who was for several years Curator of the Museums at Teflis), and by his pupil Herr Tiedemann, both of Stuttgart. The great interest manifested by the public in the exciting and comical groups exhibited in the old Crystal Palace justifies the assumption that the present extensive Collection could not have found a more appropriate home than under the reconstructed roof of the same building. The illustrations of animal life here displayed contain upwards of 1500 specimens; and it may confidently be asserted that there is no other Collection which will bear comparison with it. In the compilation of this Catalogue the most recent works on Zoology have been consulted, and the multiplication of generic names has been, as far as possible, avoided. It is hoped, therefore, that this interesting exhibition will afford, not only amusement, but also instruction in Natural History."

The Collection very properly and naturally resolves into two series, one consisting of the comical groups exhibited in 1851, the other of groups aiming to represent animals in natural attitudes and following their customary occupations. There is yet a third series suspended from the ceiling, and consisting of bird-skins, hanging over the spectator's head. The principal attraction of the comical groups is the fable of Reynard the Fox, a story immortalized by the poet Goethe and illustrated by the painter Kaulbach: the following argument is given by the compiler of the Handbook:—

"The Lion, the king of beasts, made a proclamation summoning all animals to his royal court, and all but Reynard the Fox duly obeyed the

call. In his absence grievous accusations were laid against him, and particularly by one Chanticleer, whose children he had barbarously murdered after gaining admission into the farmyard under pretence of being a hermit. The King, determining to punish Reynard, sent first the Bear, and then the Cat after him, who bore a royal mandate to the gate of Reynard's castle, where he is shown waiting for him. The Cat, like the previous messenger, is artfully led into the trap and Reynard escapes. At length, on the Badger coming to fetch him, Reynard consents to appear in court, where he is condemned to execution. While on the scaffold, by a subtle speech, he dissuades the King (the Lion) from his purpose by telling him of a great concealed treasure. In testimony of his veracity he brings forward the Hare as a witness, which forms another of the groups. Reynard then, considering himself under excommunication, resolves on a pilgrimage to the Holy Land, and is shown in his pilgrim state with a rosary and a palmer's staff. A Hare, passing before Reynard's castle, sees him in a pilgrim's garb, and Reynard, flying upon the unsuspecting traveller, uses his palmer's staff with intent to murder him. This is the subject of another group. The Hare, fleeing to the King, informs him of the attempt, and the King resolves to destroy Reynard and his castle of Malepartus forthwith. The conclusion of this tale is a combat between Reynard and one of his accusers, in which the former by his art comes off victor, and returns loaded with courtly favours to his castle, where he is represented seated at ease."

With regard to details, I must claim a critic's privilege to make a few suggestions. The "comical creatures" should not have been placed between the spectator and the light; they are not transparent, and therefore the fun of the thing is in a great measure lost by this location: they must be viewed as opaque, but their opacity is now increased to a very unsatisfactory extent; they are so placed as regards the light that it is difficult to understand and appreciate them. In an educational point of view, it may be questioned which is preferable, the florid style of taxidermy, in which these "comical creatures" are presented to our notice, or the diagrammatic style adopted in our museums; the first supposes animals acting in an impossible manner; the second virtually represents them as lifeless, and therefore incapable of acting at all; both extremes are objectionable.

In the principal series a middle course is observed; in this the animals are arranged in groups, without much attempt at scientific classification, but the animals are placed in attitudes which it is supposed they might assume when living and pursuing their ordinary avocations; more particularly the beasts of prey are

represented as seizing sheep, antelopes, deer, elks, bisons, &c. Of course the attitudes are imaginary, since the taxidermist could not have witnessed the scenes he represents, yet they appear by no means constrained, unnatural, or even improbable. They seem without exception to have been grouped with the view of diffusing correct information, and, without being rigidly truthful, convey the artist's idea of what he supposes the truth. I think it will be at once admitted that the design is laudable and well worthy the support of all lovers of Natural History.

I would venture to suggest that in the course of a very few years, when the Collection must require dusting and cleansing, and when additional specimens may be acquired, and needs must be incorporated, a re-arrangement should be made, and something like a scientific system should be adopted. Cuvier's '*Règne Animal*' should be taken as a guide, the specimens grouped in families in accordance with their natural affinities, and a brief definition—say ten or twelve lines—be devoted in the Catalogue to the essential characters of each family. A slight difficulty, a very slight one, may present itself to some in the fact that two very different animals frequently occur in the same group, and therefore a continuous series could not include them both; for instance, the first group of all, A 1, consists of two lynxes and a sheep: in all such cases it will be found sufficient to number the principal objects, the lynxes, and to leave the secondary object, the sheep, unnamed.

It is most desirable to associate words with objects; indeed, as it seems to me, this ought to be the prominent feature of juvenile education. I have no objection to a long technical description of a lion; his mane, tail, teeth and claws may be defined with precision for the instruction of the embryo man of science, but the child, the school-boy, the mechanic, learns more, and more quickly, from a glance at the object itself than from all the descriptions in the world; and, what is still more to the purpose, the memory clings with more pertinacity to an object than to a description: there is also far greater facility in connecting a name with an object than with a description. I therefore heartily commend the Collection to the notice of parents, teachers, and all who desire to infuse a love of Natural History into the minds of those under their care.

EDWARD NEWMAN.

Notes on the Lido, Torcello and the Pineta.

By the Rev. F. A. WALKER, M.A., F.L.S.

ONE is naturally led to connect the Pineta, in the neighbourhood of Ravenna, with the islands in the lagoons off Venice, inasmuch as the Entomology of the respective localities is akin, their ecclesiastical history similar, and the districts in either case consist of *ἐπικτῆτος μῆ*, land which has either been reclaimed from the Adriatic or thrown up by the receding of its waves, and accordingly, as may be supposed from the history of its formation, the Lido is flat, with a long stretch of sandy shore on the side facing the *mare apertum*, where Byron used to take his rides, and where he wished to be buried. I paid three visits to this island, which is about two miles in extent, and serves as a rendezvous for pleasure, recreation and refreshment, to such of the Venetian populace as may wish to escape from the close smells of their own canals and enjoy a sea-breeze occasionally, and are accordingly conveyed thither by an omnibus steam gondola, the said boat performing the voyage several times a day during the whole of the summer season, and bringing many customers to the excellent bathing establishment, which owns the greater part of the place. So that a ticket purchased on landing not only admits one to the baths, a long and ornamental wooden structure erected on piles driven into the sand, but to La Favorita as well, a restaurant beneath an acacia grove in the centre of the isle, containing a spacious dancing hall and ample accommodation for refreshment, and in fact enables one to traverse, without fear of trespassing or interruption, the whole spot. The only other objects worthy of notice are the Hebrew Cemetery, which wears a desolate and uncared-for aspect, with its moss-grown tombs and curious vase-shaped head-stones lying about, and the market gardens, where maize, fruit and vegetables are grown for Venice. Adriatic oysters are to be had close to the landing-place, very diminutive and surpassingly delicate in flavour.

List of Insects observed on the Lido.

Pieris Daplidice. Plentiful.	Ædipoda Germanica (blue variety).
„ Rapæ.	Vanessa Atalanta.
Colias Edusa. Plentiful.	Xylocopa violacea.
Acridium tataricum.	Satyrus Megæra.
Tryxalis nasuta.	Deiopeia pulchella.

Torcello is indeed a peculiar spot, as regards its situation, and the unrivalled historical interest attaching to the little isle, whose old name of "the wine-press" is commemorated by the numerous ancient and dilapidated vintners' shops; many of these were shut up and others in ruins, skirting the sides of the canals, which were fringed with Michaelmas daisies in full bloom when our gondola was punted along these channels, of narrow width indeed, but by no means insignificant on that account, when we reflect how they contributed to the safety of the early Church of those regions, at a period when the inhabitants of Altinum and Aquileia fled for safety to the districts encircled by these marshes, from the desolating progress of Attila and the northern invaders; and in corroboration of this fact a massive stone chair is still pointed out on an open green outside the church, called the throne of Attila, but conjectured, with more probability, to have been the seat in which the chief magistrates of Torcello were inaugurated. For on entering the ecclesiastical edifices here, one is struck not only with their oldness, but their marvellous antiquity, containing monumental records of saints, arch-presbyters, bishops and metropolitans, several of whom passed away before the erection of the earliest Venetian church, and whose memory is only preserved by a half-effaced inscription, green with damp from the sea-mists arising from the lagoons all round this quarter; and one is led to observe how, not only through their geographical position, but also by the style of the architecture employed, the said buildings serve as a link between the Eastern and Western branches—they are basilicas rather than churches. Not far from our landing-place was a small orchard, of which half had been mown, while half was still covered with lucerne, and the field in question was intersected by a ditch filled with Michaelmas daisies from end to end, where Rapæ and Edusa, as a natural consequence, swarmed.

My visit to the Pineta, so celebrated for having furnished the timber for the Roman fleet, and renowned in poetry from the days of Dante down to the time of Byron, took place on October 9, 1872. It was, however, unattended with much success, as regards entomological captures: in spite of the bright autumnal sun glinting through the forest glades, which appeared such admirable collecting ground, I only noticed six species of *Rhopalocera* and three kinds of *Orthoptera*.

Pieris Daplidice.

,, Rapæ.

Colias Edusa.

Hipparchia Megæra.

Cœnonympha Pamphilus.

Polyommatus Alexis.

Tryxalis nasuta.

Acridium tataricum.

Œdipoda Germanica

(blue variety).

The oldest tree extant of the "immemorial wood" cannot be more than six hundred years, and by far the greater number are of completely modern growth. A considerable revenue is produced from the fir-cones of the forest, extending twenty-five miles in length, and averaging from one to three in breadth. Several oaks, moreover, are interspersed among its pines, while the undergrowth is composed partly of scrubby juniper and pyracanthus, its bright orange berries just ripe at the season of our visit. A variety of lizards, partly brown, but more frequently green, coursed out of the open into the thickets on our approach; and green frogs also, alarmed thereby, leaped from the mud banks into the pools. Notwithstanding, the general aspect of the Pineta was completely English, and its Flora likewise, inasmuch as, with the exception of a yellow-flowering Carduus, it consisted of only British plants, purple and blue scabious, wild Antirrhinum, Scilla autumnalis, &c. With its plantations, therefore, and occasional glades, it was no dark and frowning forest that met our view; and as we traversed the sandy regions, now embowered in wood, where formerly the Roman fleet rode at anchor, it appeared no longer strange that, as the soil was so similar to that of the Lido, the entomological Fauna also should be so entirely alike in both localities,—the *Lido*—*littus*,—all of the later Empire and a bygone age.

F. A. WALKER.

Notes on the Birds of New Zealand.

By T. H. POTTS, Esq., F.L.S.

(Continued from Zool. S. S. 3942.)

Kiwi (*Apteryx Oweni*, *Gould*).—As far as we are aware, the habits of the straightbilled kiwi (also called the "gray kiwi," and "blue-hen" of diggers) do not differ greatly from those of the rowi, or, perhaps we might safely say, from those of other species of *Apteryx*, due allowance being made for local influences. The long, nearly straight bill of the kiwi is used in a similar manner to that

of the rowi, and in dried specimens is of a dark horn-colour, or at times resembles yellowish ivory, but in life is of a flesh-colour, pale almost to whiteness, the minute blood-vessels of its delicate membranous covering imparting a pinkish tinge to its distal end, and a perfect network of minute veins traverse its entire length from the point to the soft bristly integument which clothes its base. About eight lines above the truncated knob of the upper mandible these minute vessels assume a stellate arrangement, from which their delicate ramifications appear to issue. We have observed that the double linear impression on the upper mandible is not always constant, as in some specimens the groove deepens into a single line as sharply defined as though marked by a scribing tool. The lower mandible is also furnished with similar minute blood-vessels, most densely crowded towards the point. On the deflected tip of the upper mandible is an impression which in some birds is nearly circular; others have this mark of almost angular shape. It is probable that a great degree of sensibility is conferred on the elongated bill by its investing membrane, so that the movements of insect prey are readily followed. We can see no reason for mistaking this elaborately organized bill for an instrument to be used like a pick for digging into hard soil, and we doubt if the kiwi ever leaves the shelter of the bush. The tongue is very short but muscular, of angular shape, and can be used in crushing insects against the flat opposed surface of the upper mandible, as the strong muscle on the lower surface gives a great degree of strength. The visual organs, which are feebly developed, are placed so as to command the movements of the upper mandible, and are protected by stiffish cilia; the ears are well developed, and as an aid in discovering food are next in importance to the olfactories. The long straggling hairs or weak bristles, planted amongst the feathers of the anterior part of the head, fulfil the useful office of protecting the eyes and head from injury; they may also guide or regulate the force of the thrust given by the bill. In life a perfect guard of feelers, they form a simple kind of defence, in strict harmony with the natural instinct of the kiwi—that of retiring cautiousness. The tarsi and feet, described as yellowish brown in life, are often as white as those of thorough-bred Dorking fowls, though now and then specimens will show a darkish tinge that stains the edges of the tarsal scales. The under surface of the feet are well protected by cushions; the claws, slightly curved, are sharp at their points,

admirable for scratching, yet they are not shaped like those of the domestic fowl, which are adapted for traversing hard ground as well as for that purpose. The robust tarsi, defended by hard scales, are articulated with the tibiæ by very strong joints, which must give to the kiwi great power of leaping or jumping, and thus enable it to scale fallen trees and search along their upper surfaces for insects. The hind toes and claws help in maintaining the position of the bird when fossicking about the prostrate trunks, strengthening the hold, and preventing it from slipping to the ground when reaching down.

The cry of the kiwi is not heard till nightfall, or, as the digger expresses it technically but truthfully, "not till the night shift comes on." We have paid great attention to the call; to us it sounded like "kvee, kvee, kvee," repeated sometimes as many as twenty times in succession, with moderate haste; we noticed that the cry had scarcely ceased before it was thus replied to, "kurr, kurr, kurr." These calls were heard through the night, commencing some time after sun-down and ceasing about three o'clock in the morning; we never heard a call after dawn.

The breeding season extends over several months; eggs have been obtained on the West Coast during a great part of the year. The home is to be found usually beneath the spreading roots of trees, in logs, or under rocks, and will contain sometimes one or two eggs or young, but never more. The nests are found on the bare soil, and are never constructed of dried fern and grasses. The pair of birds usually remain together during some months and share the labours of incubation, but the male apparently allows much of the labour of rearing the young to devolve on the female. The young have been found at a short distance from the family abode—in a nursery, in fact. They are quaint-looking little animals, with not too much of the savour of youth about them, being nearly exact miniatures of the adult; that well known ornithic characteristic, change of colour, troubles them not; there is no young state of plumage with them—none of that half-pronounced variation in tone, or tint of colouration, which calls for the nice discrimination of the practised ornithologist when questions of age have to be settled. They assume not seasonal distinctions of dress; in winter and summer they adhere to their sober colours with quaker-like pertinacity. The separate lodging is probably not set up till the young are well able to forage for themselves under the guidance and

protection of the old birds; the family party is not necessarily broken up, because all its members do not abide together in one place of hiding and rest. There does not appear to be any reason for believing kiwis to be great travellers; ample supplies of food are to be obtained by fossicking around their homes. Judging from tracks, they appear to resort to the same holes for some time, probably till the family has consumed the more favourite kinds of food in the vicinity. Kiwis seem to adopt the same squatting posture as the rowi, and are quite as lethargic, suffering themselves to be captured without any other resistance than a feeble struggle, in which, at worst, a scratch or two would punish incautious handling. As for defence, the domestic cock or hen would be terrible "as a raging lion" compared to this harmless bush fowl.

They suffer from at least two races of parasites. December 17.—Took a kiwi out of a log; very white skin, legs and feet: it was infested with a species of *Pediculus*,* sandy in colour, and remarkably active in its movements; immediately below the chin hung a slatish coloured species of *Acarus*, which maintained a very firm hold and was dislodged with difficulty.

Sometimes the kiwi has been found very high up on the ranges, not very far below the snow it is said, but always in the bush.

December 24th. Took a kiwi from a rather deep hole beneath a fragment of rock, just within the scrub-bush, about a mile westward of the Franz Joseph glacier; about two miles further to the west, near the north bank of the Waio river, found a pair of kiwis in a hole under the roots of a large konine (*Fuchsia excorticata*). This pair of birds gave the following measurements:—

	Female.	Male.
Bill from gape - - - - -	4 in. 3 lines.	3 in. 6 lines.
Tarsus - - - - -	2 " 6 "	2 " 2 "
Middle toe and claw - - - - -	2 " 6 "	2 " 6 "
Total length - - - - -	18 " 0 "	17 " 6 "

It will be observed from these dimensions that the female slightly exceeds the male in size, and that this disparity is most noticeable in the length of the bill. It is also commonly said that the female kiwi is the larger bird, and dissection of several specimens confirmed

* I shall esteem it a great favour if any of my New Zealand correspondents will send me parasites of any suckler or bird: they may be dropped into small phials containing a dessert-spoonful of sawdust and a morsel of cyanide of potassium as big as a pea.—*E. Newman.*

this statement. In all cases we found the gizzards to contain a very considerable quantity of rough pieces of slate and quartz, also rarely a few very hard seeds. These stony fragments in a fair average gizzard weighed as much as $114\frac{1}{2}$ grains, five of the largest pieces weighing about five grains each. We believe the hard seeds had not been picked up for food, but for the purpose of trituration, probably in some locality where bits of stone were rarely met with.

When the kiwi is deprived of its skin or feathers, immediately below the lower neck on each side at the base of the wings, there may be noticed a rather angular-shaped protuberance not unlike the mamma of certain animals. These are adipose deposits of very firm texture, which we incline to believe are of material assistance during incubation. The difficulty that has been felt in understanding how an egg so disproportionate in size can be successfully hatched by a bird not larger than an ordinary barn-door fowl has led to many curious surmises. According to Mr. Docherty, the kiwi, with her egg deposited on the bare soil, proceeds with the labour of incubation by arranging the egg between the feet, its axis or long diameter being kept parallel to the body. Now, the keelless sternum being laid on the egg, with the præpectoral masses of fat pressing on its oval sweep between the bilge and blunt end, may it not be inferred that its monstrous bulk is thus kept from slipping, while receiving its due supply of heat? Being easily turned by rotary motion initiated perhaps by the feet, the warmth derived from these fatty tumours also makes up at one end of the egg for the entire covering of the opposite extremity by the body of the bird, and thus equalizes its temperature to a certain extent. The kiwi, when relieved by its mate, or when resuming its sitting attitude after food search, would but have to reverse the position previously maintained, in order to distribute over the entire surface of the egg a fair and equal amount of heat. The sitting *pose* assumed by various species of birds is in itself a study not devoid of interest either to the naturalist or the physiologist. It is probable that, as in the case of struthious birds, the gizzard-stones are disgorged, but we have no evidence thereof; it would be most interesting to ascertain if such regurgitation takes place, also if any correlation could be traced to seasonal or sexual conditions. The fecund kiwi within a brief period has to furnish a large supply of calcareous material for the formation of the egg-shell: amongst gallinaceous birds in some cases the requisite supply of lime may be as considerable in

proportion to the size of the bird, but longer time is given for its elimination and deposition; Gallus, Perdix, or Coturnix may be cited as examples, the prolificacy of these genera being evidenced by the production of from twelve to fifteen eggs, but the formation of these spreads over many days. The inquiries which suggest themselves are as follows:—To what extent (if any) do the gizzard-stones affect the supply of necessary calcareous material for the wants of the female? Are the fragments of stone in the gizzard of the female greater previously to the breeding season than at other periods of the year? It must not be forgotten that the difficulty of obtaining the lime supply can only be fairly estimated by personal acquaintance with the habitat of the kiwi.

The feather of the Apteryx, as distinguished from the emu, exhibits the peculiarity of not possessing an accessory plume; the barrel is very short in reference to the shaft, and its diameter small. Taxidermists allege that the plumage of the kiwi is loosely attached to the skin and readily drops out, and a reason to account for the ease with which the quill parts from its sac might probably be found in the drying up of certain secretions after death. In dissecting specimens we found that the quills of the feathers over some portions of the trunk were deeply seated in the skin, so much so that we believe the bird would instantly feel the contact of external objects that might touch the spinal and femoral plumage. The thick tough skin which envelopes and protects this night toiler, working amidst the humid mosses of the bush, is rendered more completely defensive by being thus endowed with a keen sense of touch, for by the slightest displacement of its feathers the retiring cautiousness of the bird is at once awakened, and it is enabled to shrink from danger.

Dogs readily follow the scent of the Apteryx; those belonging to miners and prospectors destroy great numbers, far more than either they or their owners consume. We have observed that some kiwi-hunting dogs become so dainty that they content themselves with tearing off the head for the sake of consuming the brains, leaving the rest of the carcase untouched. Dogs that have lost their masters and have gradually entered upon a wild life are on the increase on some parts of the coast. Several were heard of up the Wanganui river as being in packs, but no attempt had been made to destroy and stamp out this beginning of a serious nuisance to the settler. Bushmen do not dislike the flesh of the kiwi, nor is

this fact at all surprising to those acquainted with it, for although the meat is coarse it has a gamey flavour. We found the kiwi made excellent soup and stew, flavoured with pepper and salt, a few leaves of *Drimys*, tender shoots of *Rhipogonum* and *Schefflera digitata*, or piki-piki (the young curled tops of *Asplenium bulbiferum*). The gizzard is especially delicate, very unlike that decidedly tough organ of the domestic fowl. Mr. Docherty reports the eggs to be excellent eating.

This bird, it is said, exists in great abundance in the "Sound country" of the S.W. coast, but we fear that an evil day is at hand for those quaint denizens of the ancient forest; the requisitions of diggers, of collectors for museums, and the cruel slaughter by dogs, they might outlast for years; these causes are rapidly thinning their numbers, but they are not suddenly sweeping the *Apteryx* from the face of the earth. The new source of danger, it is said, arises from "that deformed thief, Fashion." A demand is springing up for the skins to furnish material for muffs for frivolous women; although the thought may seem far-fetched, who knows but this female vanity may be the means of modifying the serene climate of the West Coast, by causing the extermination of an ancient race of insect-eaters, usefully employed as preservers of the forest. However much, on economical grounds, we may question the right or policy of permitting the extirpation of so useful a check on insect-life, in this colony a strong protest against such barbarity cannot be expected; a few lovers of Nature might raise their voices against it, but their words would fall unheeded unless backed by general opinion from without our little sphere. Instead of protest it is more likely that some blatant announcement would be circulated of the establishment of a new local industry. It would not be the first instance of living on destruction which could be euphemistically explained as "subduing the wilderness." That the race of the *Apterygidæ* is indeed ancient is proved by their being found on islands separated by deep channels from the mainland.

Before concluding these remarks on the straight-billed kiwi it should be stated that specimens obtained south of the Waitaroa river, in Westland, present some differences of plumage by which they can readily be distinguished from skins in the Canterbury Museum, which were obtained in the neighbourhood of Hokitika. The birds from the northerly districts have a more flocculent plumage, lighter in tone than those which are found in the country

lying under the shadow of Mount Cook. Specimens are occasionally met with that are here and there marked with white, as on the anterior neck, thigh, &c. Mr. Docherty, the kiwi hunter, informed the writer that up to the close of last year (1871) he had killed about 2200 specimens of the kiwi and rowi (*Apteryx Oweni* and *A. australis*).

Brown Kiwi (*Apteryx* Mantelli, *Bartl.*)—The brown kiwi, or the North Island kiwi (known as the “kiwi-nui” of the natives), is now a rare bird, seldom to be found even in places where some few years since it was not uncommon. Ornithologists have manifested a disposition to drop this species and refer it to *Apteryx australis*, on what appears to be insufficient grounds. The writer has had opportunities at divers times of becoming acquainted with living examples both of *A. Mantelli* and *A. australis*; he has examined several skins of the North Island species, whilst hundreds of skins of the southern bird have passed under his observation; the result is that he arrives at conclusions which are opposed to Dr. Finsch’s and also Mr. Buller’s views on this question. Mr. Buller writes thus:—“Mr. Bartlett draws the following distinction as to the colouring of the two supposed species—‘*Ap. australis*: colour pale grayish brown, darkest on the back. *Ap. Mantelli*: colour dark rufous-brown, darkest on the back.’ The above descriptions are applicable, the former to the female and the latter to the male of the common species.” In this paragraph Mr. Buller, in a summary way, disposes of Mr. Bartlett’s (to our thinking) correct view of the distinction in the colour of the two species, and falls into a grave error by attributing sexual difference of colouration. It may not be impertinent to ask whence have specimens been obtained, or in what collection can authentic examples be seen that display a sexual distinction of colour hitherto unknown to the troglodytal *Apterygidæ*? That which Mr. Buller terms Mr. Bartlett’s strongest point, namely, the distinction to be drawn from the scutellation or reticulation of the tarsus, is left for elucidation in Mr. Buller’s work on our birds now in progress. We have no hesitation in maintaining that the plumage *alone* presents sufficiently marked characteristics for the retention of the two species. In the ‘Catalogue of the Birds of New Zealand,’ Captain Hutton, in some half-a-dozen words, points out the distinction, which cannot be gainsaid, “*A. australis*: feathers soft to the touch. *A. Mantelli*: feathers harsh to the touch.” The nut is cracked at

a blow. The feathers which clothe the southern bird are produced into soft hair-like points; the hand passed over the plumage against the lay of the feathers encounters an almost downy softness; when compared with a similar test applied to the covering of *A. Mantelli* it might be fairly so termed. The reason is obvious; the feathers of the latter species are produced into hair-like points of almost bristly stubbornness. This contrast in the character of the plumage is distinguishable in the young state. In Christchurch, either in the Museum or in private hands, there are specimens from which such a comparison can be made. In the words of a man experienced in mounting the skins of *Apteryx*, "the two species could be separated with one's eyes shut." This peculiarity leads one to expect that there exists some difference in the habit of the species, depending probably on climatic influence or the physical conditions of its habitat. Dr. Finsch, after careful and repeated examinations of two specimens received from Dr. Buller, cannot bring himself to consider the species as distinct, yet admits (which he may safely do) that the harshness of the plumage on the occiput and hind neck of *A. Mantelli* may be constant; he gives also a very plain and good reason why it is so, namely, from the structure of the feathers. The conclusion he arrives at is that *A. Mantelli* may be a local form of *A. australis*. Now comes our difficulty, in admitting distinct and constant varieties to form what may be termed sub-species in our Fauna, it may be only reasonable to ask where the line is to be drawn and who is to draw it? What authority is to decide the nice question as to the points which separate the distinct variety from a good species? In 1852 the late Captain Daniells, of Rangitikei, one of the pioneers of the Wellington settlement, spoke of the brown kiwi as then being procurable from the Maoris. From reliable sources the writer is aware that it is frequently heard in the bush in the neighbourhood of Tauranga.

A New Classification of Birds.

At the Scientific Meeting of the Zoological Society held on the 3rd of February, as already recorded in these pages, a paper was read by Mr. A. H. Garrod, on the Classification of Birds, mainly based on the disposition of the muscles and other soft parts. The following tabular summary of this paper is given in 'Nature' for

February 12th. In alluding to this classification I abstain from expressing any opinion, whether favorable or adverse. The muscles which on account of their marked tendency to variation in birds most attracted Mr. Garrod's attention were the femoro-caudal, the accessory femoro-caudal, the semitendinosus, the accessory semitendinosus, and the ambiens. Observations of these five muscles have been made on more than five hundred species of birds and on more than six hundred specimens.

The result of this laborious, if not exhaustive, examination is the division of the class Aves into two subclasses, Homalogonati, in which the ambiens is present, and Anomalogonati, from which it is always absent: a further explanation of these terms is given in a foot-note appended to each, thus—Homalogonati, with the knee normal, that is, with the ambiens crossing it; and Anomalogonati, with the knee abnormal, that is, with the ambiens deficient. In the table which follows no further characters are given, but the names of different groups give a satisfactory idea of their contents.

Class AVES.

Subclass HOMALOGONATI.

Order I. GALLIFORMES.

Cohort 1. STRUTHIONES.

Fam. 1. Struthionidæ.

Subf. 1. Struthioninæ.

„ 2. Rheinæ.

Fam. 2. Casuariidæ.

„ 3. Apterygidæ.

„ 4. Tinamidæ.

Cohort 2. GALLINACEÆ.

Fam. 1. Palamedeidæ.

„ 2. Gallinæ.

„ 3. Rallidæ.

„ 4. Otididæ.

Subf. 1. Otidinæ.

„ 2. Phœnicopterina.

Fam. 5. Musophagidæ.

„ 6. Cuculidæ.

Subf. 1. Centropinæ.

„ 2. Cuculinæ.

Cohort 3. PSITTACI.

Order II. ANSERIFORMES.

Cohort 1. ANSERES.

Fam. 1. Anatidæ.

„ 2. Spheniscidæ.

„ 3. Colymbidæ.

„ 4. Podicipidæ.

Cohort 2. NASUTÆ.

Fam. 1. Procellaridæ.

„ 2. Fulmaridæ.

Subf. 1. Fulmarinæ.

„ 2. Bulweriina.

Order III. CICONIIFORMES.

Cohort 1. PELARGI.

„ 2. CATHARTEÆ.

„ 3. HERODIÆ.

„ 4. STEGANOPODES.

Fam. 1. Phæthontidæ.

„ 2. Pelecanidæ.

„ 3. Phalacrocoridæ.

„ 4. Fregatidæ.

*Cohort 5. ACCIPITRES.**Fam. 1. Falconidæ.*

,, 2. Strigidæ.

*Order IV. CHARADRIIFORMES.**Cohort 1. COLUMBÆ.*

,, 2. LIMICOLÆ.

Fam. 1. Charadriidæ.

,, 2. Gruidæ.

,, 3. Laridæ.

,, 4. Alcidae.

*Subclass ANOMALOGONATI.**Order I. PICIFORMES.**Fam. 1. Picariæ.**Subf. 1. Picidæ.*

,, 2. Ramphastidæ.

,, 3. Capitonidæ.

*Fam. 2. Upupidæ.**Fam. 3. Bucerotidæ.*

,, 4. Alcedinidæ.

*Order II. PASSERIFORMES.**Fam. 1. Passeres.*

,, 2. Bucconidæ (?).

,, 3. Trogonidæ.

,, 4. Meropidæ.

,, 5. Galbulidæ.

,, 6. Caprimulgidæ.

,, 7. Steatornithidæ.

,, 8. Coraciidæ.

Subf. 1. Coraciinæ.

,, 1. Momotinæ.

,, 3. Todinæ.

*Order III. CYPSELIFORMES.**Fam. 1. Macrochires.**Subf. 1. Cypselinæ.*

,, 2. Trochilinæ.

"The Homalognatous birds must be divided upon a different basis, and their myological formulæ here come into service. Before going further it is necessary to show that the habits of the species are not the cause of their myological peculiarities in most cases, though probably in some they do affect them. The heron and the swallow have the same formula, and yet how different their habits? the same may be said of the owls and the swifts; the kaleege and the flamingo. The auk and guillemot, however, are most probably but distantly related to the ducks and penguins if the peculiarity in the nasal bones has the importance that I assign to it; nevertheless, the muscles of their legs agree more with them, than with the other Schizorhinal birds. By a glance at Table II. the manner in which the Homalognati may be best subdivided according to the facts that I have been able to bring forward, may be obtained. Commencing with the orders, the Galliformes include all those birds related to the fowls; and notwithstanding the high opinions to the contrary, I cannot feel justified in separating the struthious birds away from this group. It is not difficult, after having seen the formula of the Musophagidæ and Cuculidæ (Table I.), to recognise that these families have nothing to do with the Anomalognatous birds, although they are peculiar in the former having no cæca, and the latter a nude oil-gland. The Psittaci also cannot be placed anywhere else.

"The Anseriformes all agree, with the exception of the storm petrels, which are also otherwise difficult to place, in wanting the accessory semitendinosus (Y)* and in having the great pectoral muscle very elongate. The

* These letters refer to a table for which I have no room.—E. N.

whole family of petrels are exceptions in this point also, and may have to be put in the next order, amongst the Ciconiiformes.

“The Ciconiiformes include amongst them the Accipitres, but myology is in no point more clear than with regard to the unnaturalness of that family as at present defined. Every eagle, hawk, true vulture and owl, has for formula A. The secretary bird, which is generally placed with them, is represented by B X Y; from which it is seen to be as different from them as it can possibly be. This shows that the position of *Serpentarius* must be changed; that it is not a raptorial bird at all; and that, as in formula and general appearance it resembles *Cariama*, it must be placed near it and the bustards. Similar arguments indicate that the *Cathartidæ* are not true Accipitrine birds, but must form an independent family, though still in the same order as the falcons.

“The *Charadriiformes* all possess the peculiar nasal arrangement which I have termed *Schizorhinal*. The *Turnicidæ* and *Parridæ* are included with the *Limicolæ*, and the *Pteroclidæ* with the *Columbæ*.

“The justification of many of the smaller divisions of the above orders will be seen by comparing the myological formulæ, and by a review of the osteological, pterylographical, and visceral arrangement of each.

“In any attempt at classification on new facts, it must be remembered that there must be great inequality in the importance of the results arrived at in each order as freshly defined. In one family there may be a uniformity in a particular structure which is greater than could possibly have been expected; whilst in another the previously constant character may be one of the most uncertain. For instance, the left carotid artery is alone present in all the *Passerine* birds that have ever been examined; but amongst the bustards the great bustard has two, Denham's only the right, and *Tetrax* only the left. Therefore it is not to be wondered at that myology is equally uncertain in its indications sometimes, though on other occasions its teaching is most decided. In the above attempt at a new arrangement, it has been my endeavour to bring forward the results of observations made during a considerable time, with the facts obtained from previous work always kept prominently in the foreground.”—*Reprinted from 'Nature,' February 12.*

Although I have said I shall give no opinion on the merits of this classification, I may express the pleasure I feel at finding a naturalist of Mr. Garrod's power devoting his abilities to classification, a subject so generally neglected. The theory of Evolution would make every bird the descendant of the same monad, and thus abrogate the reign of law; and the taste for name-changing is now so prevalent that we may say of names—

“That of an hour's age doth hiss the speaker,
Each minute teems a new one.”

Thus classification or the just approximation of like to like has become a dead letter.

EDWARD NEWMAN.

A Visit to the Breeding Haunts of the Frigate Bird.

By GERVASE F. MATHEW, Esq., R.N., F.L.S.

ON the 26th of February, at 4 P. M., we left Panama under sail for the island of Taboga, and arrived and anchored off the village a few minutes before six the same evening. On our cruise we passed close to the island of Taboguilla, which is situated about two miles to the eastward of Taboga, and over a wooded point to the extreme westward of this island I noticed numbers of frigate-birds hovering and wheeling above the trees. On this occasion I paid little attention to them, as I scarcely imagined that at this time of the year they would be breeding; but as day after day, and at all hours, they were constantly to be seen in great numbers flying over the same locality, I came to the conclusion that they were either breeding or else had some other strong attraction to induce them to frequent that particular point of the island so continuously, and I therefore determined to pay them a visit as soon as possible.

On the afternoon of the 4th instant, accordingly, one of my brother officers having volunteered to accompany me, we sailed over to Taboguilla to investigate the quarters of these singular birds. On arriving at the west end of the island,—where there were a few irregular and rather lofty rocks, thickly overgrown by a species of evergreen shrub possessing sub-ovate and dark green shining leaves, something like those of the mangrove,—frigate-birds were observed flying, or rather wheeling, in vast numbers above the bushes, and on the bushes themselves the birds were assembled in multitudes. These rocks were detached from the main island, and to land on one of them was anything but an easy task to accomplish, on account of its rugged and precipitous sides, besides which a strong tide which ran between us and the mainland of Taboguilla prevented us from mooring our boat without considerable difficulty and danger. However, at last we found a safe place where we were able to secure our boat, and from whence we managed to scramble up the face of the cliff to the bushes above. It was terribly hot work, and a tropical sun pitilessly scorched us as we ascended,

and made the rocks to which we had to cling feel almost red hot. We were exceedingly glad to reach the shelter of the bushes, and on gaining them we paused a few minutes to recover our breath and admire the scenery. The stems of the shrubs, the ground beneath them, and most of the neighbouring rocks were covered with a thin coating of white guano, which was by no means unpleasant to our olfactory nerves; indeed the odour was somewhat stimulating and tended to refresh one, and was as beneficial as a pinch of snuff. After a few minutes' rest we pushed on our way through the bushes until we reached one of the highest peaks of the islet, and on arriving here we witnessed a sight it is impossible for me to give anything but the faintest idea of. On the ground around us between the rough boulders were shown the nests of the booby, which were merely composed of the dead leaves fallen from the adjacent bushes, and were so close together that we nearly walked on them. These either contained eggs or young. The eggs were usually two in number, and of a dirty bluish green colour, thickly covered with a chalky substance, but although there were always two eggs in a nest I never saw more than one young bird. Perhaps the turkey buzzards which were flying plentifully overhead could have given a satisfactory reason for this. These young boobies were of all ages from the young squab just hatched to the fully fledged bird able to fly; the former were horrible-looking creatures, blue-skinned and without any vestige of down, and felt quite cold to the touch; but some of the half or three-quarter grown birds were covered thickly with snow-white down, through which, in some of the older ones, the large wing and tail-feathers were just appearing. These birds as we approached them stood up to "attention" and snapped at us in a solemn manner with their beaks as we passed. On the bushes above, the frigate-birds sitting on their nests regarded us with the utmost indifference, and it was only when we walked close beneath them or were actually climbing to their nests that they condescended to move and fly away, and even then they almost permitted us to touch them before they left. As a rule, when we approached the vicinity of the nests and began to shake the trees and clap our hands the birds disgorged whatever happened to be in their pouches before they flew off, and this invariably consisted of half-digested and very putrid fish, which fell unpleasantly near to us.

The nests of these birds are extremely loose in structure, and

reminded me very forcibly of those of our own familiar wood pigeon, with the exception of being much more open in their arrangement. They are simply composed of a few twigs and dry bents, and it struck me as being an extraordinary fact that such a large egg could be accommodated on so small a platform. I was also curious to know how the birds managed to collect the twigs, &c., to build their nests with, as I felt convinced, from their awkward habits when perched, that it was utterly impossible for them to pluck them from the trees themselves. I had not, however, to wait long before this difficulty was solved, for I observed the old birds collecting the dead and fallen twigs which were floating in the sea close to the rocky shore, and this they managed to do as they skimmed or hovered over the surface of the water. As soon as they had secured a twig they flew off to the spot they had selected for their nest, and with the same hovering or flapping motion as they hung above the trees they fixed the twig securely in its place. Here and there the female bird was sitting on, or adjacent to, the newly-commenced nest, and received the twig brought to her by her mate and adjusted it to her own satisfaction. These nests were placed very close together, and it seemed astonishing that the birds did not occasionally make mistakes.

On looking up from below while the old bird was sitting on her nest nothing whatever could be seen of her large white egg, but by shouting at the bird and shaking the tree she might at last be induced to leave her nest. This was accomplished in a most clumsy manner and accompanied by a great flapping of wings, and it was a marvel that the egg was not hustled off the nest to the ground beneath; but with all their apparent awkwardness the old birds, as they left their nests, appeared to drop their egg from between their thighs lightly on to their frail nest. In all the nests we examined to-day there was never more than one egg, and in only one was there a young chick, and this was but just hatched, thereby proving that at this time of the year these birds had only commenced to breed.

In plumage they varied considerably, but of course this might be due to their different age or sex. I observed on many occasions the old males feeding the females on their nests, and these were of a deep greenish glossy black hue, and possessed bright scarlet pouches, which, at their pleasure, they seemed to have the power of distending to a most extraordinary degree. This might possibly

be an indication of affection towards their wives, but whatever it was, these old fellows, at a distance, sitting amongst the dark green foliage, looked as bright as peonies. Others had black heads with white cheeks and throats, and the rest of their plumage rusty iron-black. Some, and I do not feel quite certain what they were,—perhaps very old females,—had snow-white heads, throats and necks, and were ornamented with a conspicuous white transverse bar across the upper wing-coverts.

On the arrival of the males the females uttered a low sibillating cry, accompanied by a soft snapping together of their mandibles. The males, however, were most awkward in their manners, and often flew quite abruptly into their nests, alighting sometimes on the backs of their mates and almost dislodging them, and it was quite marvellous to me, considering the scuffle which then ensued, that the eggs were not pushed out of the nest.

While we were investigating the breeding-grounds of these birds, the greater part of the community wheeled in circles over our heads, every now and again descending and expressing their anger at our intrusion by a violent snapping of their beaks. They were so numerous at times that the sky was quite black with them, and from the ship I was told it appeared as if a dark moving cloud hung over that portion of the island during our visit. We expected we should be covered with vermin after our stay among these birds, but strange to say we were in no way annoyed, and I only saw a solitary specimen of a very minute species of bird-louse. Frigate-birds when placed on the ground, like albatrosses and large petrels, are perfectly helpless.

Besides the birds above noticed there were, in certain localities, colonies of herons, apparently consisting of two species. Both appeared to have recently bred, for I observed young birds strong on the wing. One of the species, and that the most numerous of the two, was of a bluish gray, with black head, yellow cheeks and legs; the other was of an uniform dirty buff; both about the size of the common night heron. The former species uttered a peculiar cry, which, until we had seen the bird, we took for the yelping of a cur.

GERVASE F. MATHEW.

H.M.S. 'Repulse,' Taboga, Bay of Panama,
March 21, 1874.

Fossils from Recent Deposits in the Valley of the Thames.—During some recent extensive draining operations, under the Health of Towns Act, at Reading, a trench was carried for nearly a quarter of a mile through some low meadows between the rivers Kennet and Thames, near their confluence. The soil for the first ten or twelve feet was peaty, diversified with beds of blue and yellow clay. Part of the trench followed the course of a small brook or drain, and this portion was cut through peat and shell-marl. All the superficial strata rested on the Thames gravel, and this on the chalk. An immense number of bones were turned up during this excavation, but few of these have unfortunately been preserved; but from the accounts of eye-witnesses, I believe at least one perfect human skeleton and several skulls were exhumed; and at one point below the level of the bed of the Kennet, lying in the gravel beneath the shell-marl, a curious implement was found by Mr. Mitchener, of Staines, consisting of the burr and brow-antler of a small deer, with about an inch of the beam attached, neatly cut off and apparently hollowed out for the insertion of a handle. It is suggested that this was used as a salmon-gaff. A similar implement, but larger, has since been obtained from the gravel at Egham associated with an elephant's molar and the remains of a large ox: I am told that the point of the antler in the second specimen has evidently been sharpened. The beam of an antler of the red deer in my possession is covered with tool-marks and the tines have been carefully cut off and their stumps rounded; I think this must have served as the handle to some tool or weapon, for the parts where the hands would naturally grasp it are smooth and bright. I do not know from what depth this was obtained, it having been rescued from the stores of a bone merchant, to whom most of the fossils found their way, I fear. The bones of a fore leg were found, which Mr. Jones, Geological Professor at Oxford, attributes to *Bos primigenius*, and a jaw, with teeth, of the same. The "navvies" spoke of these being parts of an entire skeleton, most of which was undisturbed. Mr. W. Palmer, of Reading, intends attempting to recover the rest of these bones. No perfect skeleton of *Bos primigenius* is to be found in any British museum. Remains of the smaller *Bos longifrons* were abundant; I have seen three horn-cores turned up at one stroke of the spade: some tolerably perfect crania were found, but not preserved. According to the report of the navvies a skeleton of this or of some small ox was found not far from that of the larger species before referred to. Bones which Mr. Waterhouse, of the British Museum, attributes to the following animals, were brought to light:—wolf, dog, horse, goat; and the fragment of the jaws of an immense deer, which he doubtfully identifies with *Megacerus hibernicus*. I found remains of the fox, boar and red deer: horns of the latter of a large size were not uncommon; a fragment in my possession measures eleven inches round the burr. The skull of a horse (male),—and apparently that of an animal four years old, for the "mark" is

still present and of a fair depth,—shows its original possessor to have been about the size of a Shetland pony. Some smaller bones, perhaps referable to the roe and hare, were found in the shell-marl associated with most of our fresh-water shells. The absence in these deposits of any bones that can with certainty be attributed to the sheep, the large size of the remains of the deer, and the small size of those of the horse, besides the presence of bones of the extinct ox, seem to imply that the age when these beds were laid down, though, geologically speaking, only yesterday, was before the dawn of History in these islands.—*Henry M. Wallis; Reading.*

Piebald and Malformed Rat.—About a fortnight since I saw a curious variety of the common rat, the head, neck and shoulders of which were of the usual brown colour, but from thence to the tail it was pure white. It was also malformed, having but three legs which it could use, the fourth (one of its fore legs) being completely concealed under the skin, and lying backwards from the shoulder, and adhering to the side of the body. On dissection this limb appeared somewhat emaciated, but perfectly formed, with the exception of the toes, which were not quite perfect. It was a fine animal, quite fat, and appeared to have enjoyed perfect health. It was caught in Plymouth.—*John Gatcombe; 8, Lower Durnford Street, Stonehouse, Plymouth.*

Common Buzzard in the Isle of Wight.—A female buzzard, in perfect plumage, was trapped at Wooton on the the 23rd of December, 1873.—*Henry Hadfield.*

An Osprey carrying off Young Chickens.—In the spring of 1871 a railway porter, near Tunbridge, had no less than eleven young chickens carried off by an osprey. His wife happened one day to hear a great commotion among the poultry in the garden, and, rushing out of the house, was just in time to see a large hawk flying off with one of her chickens in its claws. On her husband's return she informed him of the circumstance. The same thing happened several times, the bird returning twice and even thrice a-day for his unwonted meal. At last the man determined to try and kill the aggressor; so, accordingly, he borrowed a gun, and as evening drew on he awaited his unwelcome visitor. Nor had he long to wait, for the old hen soon made him aware of the enemy's approach by her loud and continuous cackling, as she gathered her remaining young ones under her wings. So intent was the osprey on his prey that he never noticed the porter, who, as the bird made his final stoop, let drive, and stretched it dead beside its intended supper. The next day he took the bird to a gunsmith in Tunbridge Wells, who sold it to a lady staying there, at the same time informing her of the circumstances connected with its capture. Being rather incredulous, she drove over to see the porter himself, who corroborated the gunsmith's statements. I saw this bird a short time ago,

and there is no doubt as to its being a genuine *Pandion Haliæetus*, and a very fine adult specimen too. It has been successfully set up in a most life-like attitude by Mr. B. Bates, naturalist, of Eastbourne.—*Arthur John Clark-Kennedy; Hyde Gardens, Eastbourne.*

Hobby at Godalming.—Two beautiful specimens of the hobby were shot at Compton about the 15th or 16th of February, which I have by me in good preservation.—*W. Stafford; Godalming.*

Eagle Owl at Bridgnorth.—Last autumn a fine specimen of this bird (*Bubo maximus*) was shot by Mr. Reynolds, of Hermitage Farm, Bridgnorth, and stuffed by Mr. Edwards, taxidermist, of Wolverhampton. A friend of mine informed me of the occurrence and offered to procure the bird for me, but received no reply to a letter he wrote about it. He, however, went there to spend his Easter holidays, and brought the bird back with him. I think it is a male; its length is twenty-four inches. It is of a rich dark colour, and is now in the possession of Messrs. B. Cooke, jun., and Co., naturalists, of 21, Renshaw-street, Liverpool.—*Nicholas Cooke; Gorsey Hey, Liscard, near Birkenhead, April 14, 1874.*

Black Redstart near Godalming.—A fine specimen of the black redstart was seen on Christmas-day between Godalming and Guildford; another was observed near the new railway-station about a fortnight afterwards, and a third at Milford about the same time.—*W. Stafford.*

Spring Migrants.—The blackcap was in full song on April 6th in Trereife Valley, about a mile from Penzance. This is the earliest date I ever recorded the first song of the blackcap, but it happened to be a genial spring morning with plenty of sun. At the same time I heard the song of the chiffchaff for the first time in this neighbourhood, which is unusually late. I heard it on the 28th ultimo in the eastern part of the county. It may be well to remark that both the chiffchaff and blackcap remain with us all through the winter in limited numbers, and I expect that the bird I heard this morning was no migrant, and simply commenced his spring song. I heard no more of the blackcap's song till Monday, the 20th, when they were generally distributed. I observed swallows on the Marazion Pond on the 11th. On the 21st I heard the first song of the sedge warbler, and on the same day the first hoopoe was obtained from the grounds of Clowance, in an eastern district. As these birds always appear in larger or smaller numbers every spring with us, it may be well to note the earliest arrival. Cuckoos, willow wrens and whitethroats have not reported themselves. Garden warblers, lesser whitethroats, wood wrens, reed wrens, nightingales and redstarts do not visit our western shores.—*Edward Hearle Rodd; Penzance, April 22, 1874.*

Tree Sparrow.—In Capt. Hadfield's remarks on the birds seen in a three weeks' tour in Brittany (S. S. 3945), he says:—"Tree Sparrow.—Numerous nests of this species, I believe, were observed in some tall and leafless trees

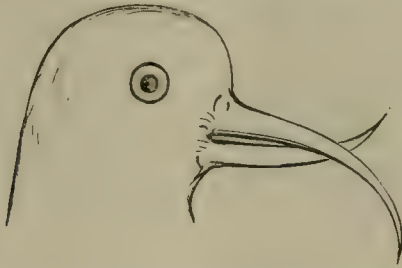
by the roadside." These nests were probably those of the house sparrow, which frequently builds its nest in the branches of trees; but this is never the case with the tree sparrow, which invariably builds in holes in old trees, as pointed out by the late Colonel Montagu. Some years ago I saw several pairs which had their nests in the holes of some old pollard-willows near Aldwinkle, in Northamptonshire.—*H. Doubleday; Epping, April 16, 1874.*

Peculiar Position in Feet of *Certhia familiaris*.—A short while ago, when attentively observing the movements of a creeper as it ascended several trees, I was struck with the position of the feet. Instead of the tarsi being parallel to each other or nearly so, and concealed with the toes beneath the body of the bird (of course I do not mean concealed from a person viewing the bird sideways), as I had always supposed, the legs were extended laterally and a little forward, so as to have the toes on a level, so to speak, with the neck, and both toes and tarsi were visible. I have little doubt but that every creeper puts its legs in a similar position, and I attribute the fact of my never having noticed them before to the great similarity which exists between the colour of the legs and the bark. You must get quite close; if you are content with watching from a distance the legs are apparently concealed. If the three points of support be joined, namely, the toes and the extremities of the shafts of the tail-feather, an isosceles triangle will be formed, the vertical angle of which is very much larger than I had supposed it to be. I am not sufficient mathematician, nor have I the data to determine the size of the angle which in the case of the creeper gives the maximum amount of stability. In all probability the bird chooses the best position itself. Perhaps there may be nothing new in the fact above mentioned, but no mention is made in any book I have examined.—*Richard M. Barrington; Fassaroe, Bray, April 20, 1874.*

Wood Pigeons laying in January.—Two young wood pigeons were taken from a nest by Mr. Marshall's man servant on the 15th of January, 1874. On the 15th of February Mr. G. Barrett informed me that he knew of three wood pigeons' nests, two containing young, the other eggs only.—*William Stafford.*

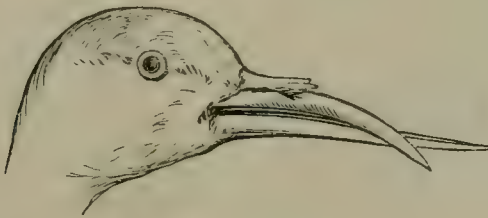
Curious Malformation in the Mandibles of a Shortfaced Tumbler.—As soon as this bird left the nest it was evident that the mandibles did not meet in a natural manner, the points slightly crossing by reason of the upper mandible bending to the right; the extremities, particularly of the upper mandible, were slightly dilated and slightly spathulate, a formation which that eminent pigeon-breeder, Mr. Tegetmeier, considers a necessity of the well-known mode in which young pigeons take their food: throughout the winter the form of the mandibles was continually changing, and always in one direction, until in April they have attained the form represented in the figure, the upper mandible being much the longer and more curved, and terminating in a point as sharp as a needle; between the mandibles is

a considerable vacant space, so much so that on viewing the head in profile I can see plainly between them, any object that happens to be on the



other side. The bird has the greatest difficulty in obtaining food; as the mandibles do not meet it has no ability to pick up peas or grain, but it manages to glean a few bread-crumbs, and on these it has hitherto subsisted.

—*Edward Newman.*



Malformation in Upper Mandible of a Redshank.—On the 16th of August, 1873, my brother shot a redshank near Orford, Suffolk, with an apparently double upper mandible. It appears that by accident, possibly whilst fighting, or by a grazed shot, or, as Professor Newton suggests, through coming in contact with a telegraph-wire, the upper mandible has been struck just below the nasal aperture; this has driven the anterior portion of that mandible out of place, which, no longer having the lower mandible to support it, is curved downwards by its own weight: since the injury, however, Nature, with her marvellous healing power, has renewed the upper surface of the posterior portion of the upper mandible to a great extent, and this part has grown a little. I have no doubt that in course of time this stump would have formed a new upper mandible and the injured portion have dropped off. The bird, as might be expected, was in very bad condition, and so weak that it could scarcely fly; it was a bird of the year, and must have sustained this damage before its beak was fully developed, as the upper mandible, which of course has not grown since it was injured, if straight and in its correct position would now be more than a quarter of an inch shorter than when grown to its normal length. It is wonderful how

the poor bird could manage to eat at all; perhaps it was fed by its companions.—*H. Durnford*; March 20, 1874.

[I think the solution of this malformation must be found in the fact that a shot had penetrated the mandible, cutting it sufficiently to cause it to hang downwards, but not sufficiently to cause a complete separation. I have more than once seen birds' beaks injured in this way. I must forbear expressing any opinion on Mr. Durnford's theory that a new upper mandible would have been eventually formed and the injured portion have dropped off. I can scarcely accept the theory that the poor bird was fed by its companions.—*Edward Newman*.]

Fishes killed at Scilly by the late Gale.—A proof, as unusual as it is conclusive, of the violence of the gale of Monday, April 13th, is afforded by the fact that large fish—conger, hake, ling, &c.—were tossed about in their watery homes near the Islands of Scilly and at last flung by hundreds on the rocks. This was more particularly noticed at St. Martin's, where our informant saw them lying on the shore heaped one on the other. The sea was seen from St. Mary's to break over the highest part of Bryher. The fish near the Land's End fared as badly as at Scilly. Mr. John Symons, jun., of Mayon House, picked up fish fully five hundred yards from Whitsand Bay. Five of these presenting a strange appearance, Mr. Symons forwarded them to Mr. T. Cornish, the honorary secretary of the Penzance Natural History Society, who identified three of them as specimens of the small-mouthed wrasse or rock cook (*Crenilabrus exoletus*). "They were," to quote Mr. Cornish's words, "entirely bereft of the thick, strong scales which ought to cover their whole body. The largest had received a heavy blow on the mouth, which dislocated some of its maxillary arrangements and gave it a somewhat bull-dog look." No wonder; for the sea and the winds must have used the fish roughly to toss it on the shore and hurry it the third of a mile over sands and up the cliffs. Two larger fish were the rare tadpole-fish, or trifurcated hake, or lesser forked-beard (*Raniceps trifurcatus*), both very much knocked about. Mr. Cornish adds:—"Both sorts of fish are denizens of rocky bottoms, and the wrasse stick closely to sea-weed. Their presence in the spot indicated speaks much for the weight of the gale which hove them on shore."—*G. M.*

Fishing Frog at St. Leonard's.—One of our trawlers has brought in two fine specimens of *Lophius piscatorius*. One measured:—Length, four feet five inches; breadth from tip to tip of pectoral fins, three feet three inches; gape one foot. The other was—Length, five feet; breadth from tip to tip of pectoral fins, three feet; gape, one foot. The dimensions of the two are discrepant, probably this is sexual. Yarrell (vol. i. p. 269), says, "The

angler has been known to measure five feet in length, but the most common size is about three feet.”—*J. S. Bowerbank; 2, East Ascent, St. Leonard's-on-Sea, April 12, 1874.*

Proceedings of Scientific Societies.

LINNEAN SOCIETY OF LONDON.

March 19, 1874.—Dr. G. J. ALLMAN, F.R.S., in the chair.

The following papers were read, *viz.* :—

1. “Observations on Bees and Wasps.” By Sir John Lubbock, Bart., M.P. The paper commenced by pointing out, with reference to the power of communication with one another said to be possessed by Hymenoptera, that the observations on record scarcely justify the conclusions which have been drawn from them. In support of the opinion that ants, bees, and wasps possess a true language, it is usually stated that if one bee discovers a store of honey, the others are soon aware of the fact. This, however, does not necessarily imply the possession of any power of describing localities, or anything which could correctly be called a language. If the bees or wasps merely follow their fortunate companions, the matter is simple enough. If, on the contrary, the others are sent, the case will be very different. To test this, Sir John kept honey in a given place for some time, in order to satisfy himself that it would not readily be found by the bees, and then brought a bee to the honey, marking it so that he could ascertain whether it brought others or sent them, the latter, of course, implying a much higher order of intelligence and power of communication. After trying the experiment several times with single bees and obtaining only negative results, Sir John Lubbock procured one of Marriott’s observatory-hives, which he placed in his sitting-room. The bees had free access to the open air; but there was also a small side or postern door, which could be opened at pleasure, and which led into the room. This enabled him to feed and mark any particular bees; and he recounted a number of experiments, from which it appeared that comparatively few bees found their own way through the postern, while of those which did so the great majority flew to the window, and scarcely any found the honey for themselves. Those, on the contrary, which were taken to the honey, passed backwards and forwards between it and the hive, making, on an average, five journeys in the hour. Sir John had also in a similar manner watched a number of marked wasps, with very similar results. These and other observations of the same tendency appear to show that, even if bees and wasps have the power of informing one another when they discover a store of good food, at any rate they do not habitually do so; and this seemed

to him a strong reason for concluding that they are not in the habit of communicating facts. When once wasps had made themselves thoroughly acquainted with their way, their movements were most regular. They spent three minutes supplying themselves with honey, and then flew straight to the nest, returning after an interval of about ten minutes, and thus making, like the bees, about five journeys an hour. During September they began in the morning at about six o'clock, and later when the mornings began to get cold, and continued to work without intermission till dusk. They made, therefore, rather more than fifty journeys in the day. Sir John had also made some experiments on the behaviour of bees introduced into strange hives, which seemed to contradict the ordinary statement that strange bees are always recognized and attacked. Another point as to which very different opinions have been propounded is the use of the antennæ. Some entomologists have regarded them as olfactory organs, some as ears, the weight of authority being perhaps in favour of the latter opinion. In experimenting on his wasps and bees, Sir John, to his surprise, could obtain no evidence that they heard at all. He tried them with a shrill pipe, with a whistle, with a violin, with all the sounds of which his voice was capable, doing so, moreover, within a few inches of their head; but they continued to feed without the slightest appearance of consciousness. Lastly, he recounted some observations showing that bees have the power of distinguishing colours. The relations of insects to flowers imply that the former can distinguish colour; but there had been as yet but few direct observations on the point.

An interesting discussion followed, in which Mr. Robert Warner, Major-General Strachey, Mr. A. W. Bennett, Prof. Newton, Prof. Thiselton-Dyer, Mr. D. Hanbury, Mr. Elliot, of New York, and others took part.

2. "On *Oniscigaster Wakefieldi*, a singular insect from New Zealand, belonging to the Family Ephemeridæ, with Notes on its Aquatic Conditions." By Mr. R. McLachlan. The author gives full diagnoses of the new species and genus founded on this remarkable insect, forwarded by Mr. C. M. Wakefield from Christchurch, Canterbury Settlement, New Zealand. He has also had the opportunity of examining two individuals on the aquatic conditions of the insect. These are of different ages, and may be termed "larva" and "nymph" respectively, the larger individual having strongly developed rudimentary wings, and being evidently nearly mature, while the smaller one possesses only the thoracic lobes which indicate the position of the wings. These two states are described in detail. This remarkable insect would appear to be common at Christchurch, the cast subimaginal skins being no rarities sticking on walls, windows, &c. The Rev. A. E. Eaton considers the genus allied to *Siphylurus*, and points out that the structure of the aquatic conditions shows the creature to be of active habits, swimming freely among water-plants in search of its prey, and not semi-

fossorial as is the case with some members of the family. The great lateral expansion of the margins of the abdominal segments is without a parallel in any known perfect insect of the group. The author concludes by tracing the relations of Latreille's genus of Branchiopod Crustacea, Prosopistoma, according to the observations of N. and E. Joly, two French entomologists (father and son), who have rediscovered the creature, and who point out that there is scarcely any doubt as to the genus having been founded on the aquatic conditions of some species of Ephemeridæ.

Some discussion as to the relationships of Oniscigaster took place, in which the Rev. A. E. Eaton and Sir John Lubbock took part.

ENTOMOLOGICAL SOCIETY OF LONDON.

April 6, 1874.—Sir SIDNEY SMITH SAUNDERS, C.M.G., President, in the Chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—‘Proceedings of the Royal Society,’ no. 150; presented by the Society. ‘Proceedings of the Linnean Society of London, Session 1873—74;’ by the Society. ‘L'Abeille,’ tome ix., livr. 7 and 8; by the Editor. ‘Newman's Entomologist’ and ‘The Zoologist,’ for April; by the Editor. ‘The Entomologist's Monthly Magazine,’ for April; by the Editors. ‘Exotic Butterflies,’ part 90: by the Author, W. C. Hewitson, Esq.

Election of Members.

Messrs. W. Garneys, M.R.C.S., of Repton; Philip B. Mason, M.R.C.S., of Burton-on-Trent; and Nathaniel C. Tuely, Esq., of Wimbledon Park, were severally balloted for and elected Ordinary Members.

Exhibitions, &c.

Mr. Frederick Smith communicated to the Society the fact of his having captured seven specimens of *Andrena tibialis*, on Hampstead Heath, on the previous Friday, April 3rd, two being females and five males. One of the females had the exuvæ of two males of *Stylops* remaining in the abdomen, the other female had had one male of *Stylops*, and also a female which of course remained in the abdomen of the bee. Of the male *Andrenæ*, one contained two females, a second having one of the same sex remaining in its abdomen. Mr. Smith mentioned this circumstance to give collectors of Coleoptera an opportunity of capturing the rare *Stylops*; and recommended searching for *Stylopized* bees between the hours of nine and twelve in the morning, as, according to his experience, the *Stylops* always emerged from the body of the bee on the day on which the latter first quitted its nest, should the day be bright and sunny; and he also mentioned

the fact of his never having captured a bee which had a male *Stylops* remaining in its abdomen, at a later hour of the day than twelve o'clock. He had himself bred *Stylops* five or six times, and had never done so later than the month of April; always having captured the attacked, or infested, bees early in the day. On one occasion he bred a *Stylops* on the same day on which he had captured the infested *Andrena*, conveying the bee home, shut up in a pill-box; then, on arriving home, he had placed the bee in the sun, enclosed in a wooden box having a glass lid; when, in the course of half-an-hour, the *Stylops* quitted the body of the bee. On other occasions he had kept *Styloped* bees in pill-boxes the whole of the day of capture, but on placing them in a good-sized glass-topped box, and supplying the bee with a few fresh flowers, the *Stylops* had emerged early the following morning.

The President remarked that he had once found a large number of bees in the afternoon at dusk, some of which contained male *Stylops*, but on that occasion the morning had been wet and dull, and therefore the bees had probably only just made their appearance. Some further discussion ensued, during which the President stated that during flight the males do not move the rudimentary anterior wings (or "elytra").

Some further remarks were communicated by Mr. Gooch, of Natal, respecting the ravages of a Longicorn beetle in the coffee plantations there, which gave rise to a discussion as to whether the larvæ of Longicorn beetles attack healthy wood or not, a remark having been made by Mr. Newman in the 'Entomologist' that, according to his experience of fifty years, he had never found the larvæ of Longicorn beetles in decayed wood, or those of Lamellicorn beetles in sound wood. Mr. M'Lachlan stated that from his own observations, healthy wood was not attacked by British species of the family, though there were exceptions, such as *Saperda populnea*. Mr. Smith remarked that he once attempted to sit upon a rail which broke under him, when it was found to be infested with *Rhagium bifasciatum*, and was completely rotten; and the President had experienced the same thing in Turkey with regard to a chair which was destroyed by Longicorn larvæ. Mr. Janson thought that the larvæ of Longicorns do not attack wood, rotten from other causes; but Mr. M'Lachlan understood Mr. Newman's observation to refer to living and healthy trees.

Papers read.

The following papers were communicated, *viz.*:—

"Descriptions of Tenthredinidæ, Ichneumonidæ, Chrysididæ and Formicidæ, from Japan." By Frederick Smith.

"Further Descriptions of Lucanoid Coleoptera." By Major F. J. Sidney Parry, F.L.S.—*F. G.*

Notices of New Books.

A History of British Quadrupeds, including the Cetacea. By THOMAS BELL, F.R.S. Second Edition, revised and partly re-written by the Author, assisted by ROBERT F. TOMES and EDWARD RICHARD ALSTON. London: Van Voorst. 1874. Demy 8vo, 474 pp. letterpress, 160 woodcuts.

THE delay in the publication of this Second Edition has been a grievous annoyance to those who have been so long expecting it, and who put faith in the promises so often held out for its appearance. "Hope deferred maketh the heart sick," and many of us were "sick at heart" with hope deferred: in the present age it seems essential that our quadrupeds, as well as our birds, reptiles, fishes, shells, forest trees, ferns, butterflies and moths, should find a competent chronicler; and long and frequent have been the unavailing demands for a 'History of British Quadrupeds.' The kind-hearted and accomplished naturalist whose name has always stood, and still stands, as the responsible author, felt this as keenly as any one, for he tells us in the Preface—

"The publication of the present edition of this work has been so long delayed, that the author feels it to be his duty to explain as briefly as possible the cause of the non-fulfilment of its promised appearance, and to remove the responsibility of the failure both from his respected publisher and himself. His removal from his residence in London,—the centre of literary and scientific society and information, together with other personal circumstances over which he had no control, induced him gladly to avail himself of the well-known extensive knowledge of Mr. Tomes as regards both the history and habits of the animals to which his attention had been specially directed, and his acquaintance with foreign literature on the subject; and much of the additional interest of the earlier portion of the volume, including the orders Cheiroptera and Insectivora, is due to him, and is gratefully felt and acknowledged. It is painful to be obliged to add that the extremely dilatory manner in which this advantage was bestowed caused extreme uneasiness both to Mr. Van Voorst and to the author, and occasioned the lamented delay."—*Preface*, p. x.

This acknowledgment may be painful, but it was essential to Mr. Bell's reputation; he was necessitated to make it.

The first edition of this work was published in 1837, and is so well known to English naturalists that I need not describe it here.

It was reviewed in the very first number of the 'Zoologist,' issued in January, 1843. In this notice I express my opinion that "in enumerating the animal productions of a country it is necessary maturely to consider the claim of each to be admitted into the list;" and again, after alluding to extinct species, or species extinct as British, I proceed, "A third question touches the dog, the ox, the sheep, the goat, the horse, the ass, and those numerous other useful animals that have accompanied man in all his enterprises, and settled round him whether he has pitched his tent in the city or the desert, *these must be rejected because they exist not in a state of nature*; they are preserved by man's especial care, and without that care they must inevitably perish even by the hands of man himself."—*Zool.* 8 (1843). These were supposed to be strange doctrines, daring and almost impious doctrines, they were stigmatized as "crude," "juvenile," "ignorant," "untenable," and so forth, for "had not Mr. Bell included them all? and the pig and guinea-pig with them?" and the objector "would like to know whether Mr. Bell or Mr. Newman was likely to know best."

Thirty years after this Mr. Bell writes thus, in the Preface to his Second Edition:—"It has been thought best to omit entirely the chapters on the domestic animals which were given in the first edition, because these species cannot be properly regarded as members of our Fauna." And so they are dropped out of the work. This is as it should be; but Mr. Bell cannot thus remove the injury which his injudicious and over zealous friends at that time inflicted on the 'Zoologist,' for expressing opinions sound and truthful at the time, and now accepted as sound and truthful by himself and all men.

I introduce this subject, because this Second Edition cannot be regarded as a new work, but must be considered solely in reference to the first, and the points in which it is amended or altered have alone to be detailed here; these emendations are numerous and important, and may be ranged principally under the heads, omissions and additions: the omissions are most numerous. Three bats:—the pygmy bat (*Vespertilio pygmaeus*), because the specimen described under that name was a young pipistrelle; the notch-eared bat (*Vespertilio emarginatus*), an untenable species, as incontestibly shown by Mr. Tomes, at p. 4938 of the 'Zoologist' for 1856, to be a nonentity; and the lesser long-eared bat (*Plecotus brevimanus*), because it is the young of the common long-eared bat; the eared

shrew (*Sorex remifer*), because it is a variety of the water shrew (*S. fodiens*), every intermediate state occurring; the great seal (*Phoca barbata*), because the gray seal (*Halichærus gryphus*) has so often been reported for this species in error, and because there is no reliable authority for *Phoca barbata* having occurred on our coasts; the Irish hare (*Lepus hibernicus*), because “not distinct as a species” from the Scotch hare (*Lepus variabilis*); and the bottle-nosed dolphin (*Delphinus Tursio*), also because not certainly distinct as a species from the common dolphin (*D. Delphis*).

Besides these, the following domestics are very properly left out in the cold, for the reasons already given:—the ferret, the domestic cat, the blood-hound, the stag-hound, the fox-hound, the beagle, the pointer, the setter, the spaniel, the springer, the water-dog, the terrier, the Dalmatian dog, the shepherd’s dog, the greyhound, the Newfoundland dog, the bull-dog, the mastiff, the guinea-pig, the pig, the horse, the ass, the mule, the ox, the goat, and the sheep (common, Dorset, and Southdown). No naturalist but will cordially approve of these omissions. Mr. Bell is evidently no dog-fancier, and therefore could not feel the intense pain he inflicted on those who have a spice of that proclivity, by the figures of the canine race which his artist had apparently copied from those wooden effigies of the canine race in some child’s Noah’s ark.

I should have gone a step further than this. I should have omitted the particoloured bat (*Scotophilus discolor*), because but one specimen is supposed to have been taken, and that in a seaport; the harp seal (*Phoca grænelandica*), because its occurrence rests on insufficient evidence; the fallow-deer (*Cervus dama*), because a domesticated species; and Greenland right whale (*Balæna mysticetus*), because every notice of its occurrence in British seas is vague and unsatisfactory. Indeed, much as I respect the ingenuity and research of those naturalists who have made the so-called “*British*” Cetacea their study, I am very doubtful of the propriety of ranking any cetacean as British. There is a wide difference between seals and cetaceans in this respect; seals cannot live without coming on land, cetaceans live entirely in the sea. Mr. Bell proceeds:—

“On the other hand, *thirteen* species have been added to the list, of which one only is a land animal (*Sorex pygmæus*), two are seals (*Phoca hispida* and *Cystophora cristata*), and the remaining ten are all cetaceans. These last are *Balæna biscayensis*, *Megaptera longimana*, *Balænoptera*

Sibbaldii, B. laticeps, B. rostrata, Hyperoodon latifrons, Xiphius cavirostris, Grampus griseus, Delphinus acutus, and D. albirostris."—*Preface*, p. ix.

This extract admits of the following qualifying remarks:—*Sorex pygmæus* is identical with *Sorex rusticus* of Jenyns, described by that eminent naturalist at p. 417 of the 'Annals and Magazine of Natural History' for 1838. Professor Blasius was the first to point out that it was the *S. pygmæus* of Pallas (*Saugethiere Deutschlands*, p. 153). On examining specimens presented by the Professor to the Cambridge University Museum, the authors "can fully confirm the accuracy of Blasius' identification." The distinction between this species (*Sorex pygmæus*) and the common shrew (*Sorex araneus*) of Bell's first edition is very trifling; its value must, however, depend on its being perfectly constant or otherwise. Here it is:—

"The best characters to separate the lesser from the common shrew are to be found in the teeth. In *Sorex vulgaris* the fifth single-pointed tooth in the upper jaw, regarded by Dr. E. Brandt as a minute canine, is extremely small, and is out of the line of the others, so as to be almost entirely invisible from the outside. In *S. pygmæus*, on the other hand, these teeth diminish regularly in size, and the fifth stands in the same line as the rest, so as to be plainly discernible externally. In both species the front incisors have brown tips. In the lesser shrew the white of the lower parts is clearer, and the tail, which is longer in proportion, is more hairy at all ages, but it must be remarked that the tail is a character in which the common species is very variable."—P. 148*b*.

I shall be very pleased to go more carefully into this question at a future time, and shall be obliged for the opportunity of inspecting any specimen which may fall in the way of my readers. Although it can scarcely be expected that we should obtain a precise knowledge of our marine sucklers, some of which we may not have the opportunity of examining more than once or twice in a lifetime, yet we really have no excuse for the prevalent ignorance about our bats, our shrews, our mice, and our arvicoles. I pass on to the inhabitants of ocean.

Will my readers kindly refer to two papers by Dr. Gray, lately published in the 'Zoologist?' they are intitled, "The Seals (*Phocidæ*) that permanently reside in or occasionally visit the British Islands, by Dr. J. E. Gray, F.R.S., &c." (S. S. 3333), and a "Catalogue of the Whales and Dolphins (*Cetacea*) inhabiting or incidentally visiting the seas surrounding the British Islands, by

Dr. J. E. Gray, F.R.S., &c." (S. S. 3357 and 3420). They will then at once perceive that the two seals and ten cetaceans, now appearing as additions to our mammalian fauna, because omitted in the first edition, are by no means recent discoveries or species having their geographical range now for the first time extended to Britain, inferences that might, I think, possibly be drawn from the passage above quoted: they are recorded species, though not appearing in the first edition of 'British Quadrupeds,' and possibly not anywhere under exactly the same names. The ringed or marbled seal (*Phoca hispida*), B. Q. 247, is enumerated as a British species at p. 3335 of the 'Zoologist,' under the name of marbled seal (*Pagomys foetidus*), the synonyms are the same, and the identical specimen, that in the Norwich Museum, which is the sole authority for introducing the species, was determined and labelled by Dr. Gray himself; then again the hooded seal (*Cystophora cristata*), B. Q. 257, is mentioned at p. 3334 of the same paper, and the specimen cited as the authority for its admission into the British list is the same. Turning to the 'Zoologist' (S. S. 3361) we have the Atlantic right whale (*Balæna biscayensis*, B. Q. 387) given under the name of *Balæna britannica*; the humpbacked whale (*Megaptera longimana*), B. Q. 392, appears under the same name, S. S. 3361; *Balænoptera Sibbaldii*, B. Q. 402, will be found as *Sibbaldius borealis*, S. S. 3364; it is also the *Balænoptera boops* of Yarrell (P. Z. S. 1840, p. 11); Rudolph's rorqual (*Balænoptera laticeps*), B. Q. 407, is *Rudolphius laticeps*, S. S. 3364; the lesser rorqual (*Balænoptera rostrata*), B. Q. 411, appears under the same name, S. S. 3364; the broad-fronted beaked whale (*Hyperoodon latifrons*), B. Q. 425, is *Lagenocetus latifrons*, S. S. 3431; Cuvier's whale (*Xiphius cavirostris*), B. Q. 428, is *Petrorhynchus cavirostris*, S. S. 3431. It may be here observed that the artist, probably not a naturalist, and not aware of this character in Cetacea, has placed the tail vertically instead of horizontally. Risso's grampus (*Grampus griseus*), B. Q. 450, is *Grampus Cuvieri*, S. S. 3427; the white-sided dolphin (*Delphinus acutus*), B. Q. 470, is *Electra acuta*, S. S. 3426; the white-beaked dolphin (*Delphinus albirostris*), B. Q. 472, is *Lagenorhynchus albirostris*, S. S. 3426. All these species are, moreover, described in Dr. Gray's 'Catalogue of Seals and Whales in the British Museum,' with numerous figures in the text, and more modern ones in the Supplement to the Catalogue, which are sold at a very small price.

My object in giving these facts and synonyms is to show that the species are by no means new discoveries or additions to the British list, but they are additional and supplementary to the first edition of the 'History of British Quadrupeds,' and therefore correctly stated in the passage I have cited.

As regards the numerous changes of names which I have pointed out I express no opinion. There are two schools of nomenclature now before the public; the members of one school are attached, dogmatically and perhaps doggedly, to the received and established names they have used from childhood; they strain every nerve, urge every plea, perhaps unduly, for retaining them; the other, believing themselves under the guidance of the Rules of the "British Association for the Advancement of Science"—a decided misapprehension—search authorities, ferret out forgotten records, in fine strain every nerve to find obsolete ones. As an old man I am a member of the former; as a young man Mr. Alston is a member of the latter; I believe both of us are thoroughly in order, but my own proclivity is selfish, to please myself; Mr. Alston's may be to please others. I only say "may be," but this is certain, as an industrious, energetic aspirant for fame, he would defeat his own object were it otherwise; he would be despised, he would condemn himself, did he make no change in nomenclature.

Feeling the intense interest I do in the 'Zoologist,' it will surprise no one that I should be disappointed at seeing Dr. Gray's names so soon sunk as synonyms and his admirable papers so utterly ignored; but the case is scarcely the same with Mr. Scott's 'Descriptive Catalogue of Pinnated Mammalia, Recent and Fossil.' This admirable work, like Dr. Gray's, should have been constantly before the author, should have been quoted in every page. I say nothing of Mr. Scott's combination of Seals and Cetacea, which may appear to some difficult to reconcile, but there is an amount of research displayed throughout his labours, an intimate acquaintance with both recent and fossil sucklers, both as regards the objects themselves and the books which treat of them, the value of which it is impossible to overrate. It seems to me no work on the aquatic sucklers can be considered of authority unless it exhibits an intimate acquaintance with all the bibliology of Cetacea, and in that study Mr. Scott's stands in the first rank.

There are also points of great interest connected with our *terrestrial* sucklers which I could have wished to have seen fully

discussed and judiciously investigated, but which are here passed over in silence or but superficially glanced at; such as the period of gestation in the badger, concerning which so large a number of interesting statements have appeared in the 'Field' and 'Zoologist;' it seems scarcely creditable to living zoologists that the matter should be suffered to rest in its present obscure and unsatisfactory state: although we must by no means infer that the gestation of the bear is an infallible guide in this matter, still it would be instructive to study the natural history of so familiar an animal, and see whether a ray of light could be obtained on the gestation of the badger from this collateral source. On the species, or varieties, or races, of weasel, it would have been desirable to have expended a little labour: we cannot excuse or justify its dismissal in the following curt and crude manner:—

"The female weasel is much smaller than the male, and is no doubt the 'little reddish beast, not much bigger than a field mouse, but much longer,' mentioned by White, in his 'Natural History of Selborne,' and called 'Cane' by the people of that district. It is known in Surrey also by the name of 'Kine,' as Mr. Blyth informed us. We have received specimens of this animal from several parts of England, and find, as may be supposed, that it is nothing more than the female weasel of unusually small size."—P. 187.

My experience in the matter is certainly not extensive, but so far as it goes is in an exactly opposite direction: the only pregnant female I have seen is of the large variety, and the only two of the very small ones were males. This diversity of experience does not lead to any absolute conclusion, but it shows that the opinion has been expressed without much reflection, and is quite untenable unless supported by repeated observations all tending to establish the same hypothesis.

As a subject that has been ignored I may mention the ship rat, or snake rat (the *Mus Alexandrinus* of Southern Europe), concerning which some controversy has occurred in the 'Field,' and on which a most able paper was read before the Linnean Society by Mr. Salter, who exhibited several living specimens. Mr. Salter, in another paper subsequently published in the 'Field,' says:—

"I have recently received some rats from one of the West India Islands; they inhabit and live upon the growing heads of certain palm trees. They are not, as far as external characters go, to be distinguished from the new

British rat [the snake rat], and I believe them to be identical, though the West-India rats average rather larger size, and are more uniformly of a brown colour. In the British Museum, among the stuffed British Mammalia, is a wretched specimen, wretchedly stuffed, of the new rat, but it is incorrectly labelled 'Mus Rattus,' with which I suspect it has long been confounded. The cranial characters of the two are, however, very different, and *these differences are such as are not compatible with mere variety: they are specific.*"* (See Zool. 7232.)

Surely such a notice from such a man was worthy investigation and preservation in a 'History of British Quadrupeds;' but I think I am right in saying it is entirely ignored, unless it be alluded to in the following passage:—"We have seen a few specimens in which the back has been of a dark brownish gray, and their resemblance to the *Mus Alexandrinus* has been very remarkable; the lower parts are dark ash-colour, feet and tail dusky."—P. 306. If this be a reference to the snake rat every one of its peculiarities is omitted.

Before quite dismissing the rats, a question I think may be pertinent. Have we really two species under the names of black rat and brown rat? and what are the diagnostics? Colour will hardly avail. The brown rat has frequently brown and black young ones in the same litter. Then as to a peculiar white mark on the chest, which, in Mr. Thompson's opinion, was sufficient to characterize a species which he called "*Mus hibernicus*," this mark is occasionally found both in specimens of *Mus Rattus* and *M. decumanus*. Again a black variety of the arvicole very familiarly known as the "water mole," is continually occurring, and proves that colour in these rodents is not conclusive. This is another subject on which I wish particularly to invite communications. What are the specific *diagnostic* characters of our rats?

The illustrations do not please me. I admit there is some difficulty in giving an idea of such vast creatures as the Cetacea on so small a scale, and a difficulty also in conveying the idea of a horizontal tail when the animal is drawn laterally; but there can be no need for placing the tail of *Xiphius cavirostris* in a directly vertical position, as I have already pointed out, when we all assume that it must be held horizontally by the living animal. I say "assume," arguing by analogy: I have never seen it.

* Italics my own.

In noticing a work by a naturalist so eminent in dentistry as Mr. Bell, I feel great diffidence and greater difficulty in saying a single word about teeth; but a requirement in Natural History is perpetually forcing itself on my attention whenever a work on sucklers comes before me, and that is the want of a systematized nomenclature of teeth, and a rigid adherence to their homologues and teachings. No one thinks of applying the same name—as cranium, humerus, scapula, pelvis, femur, &c.—to bones in different species of sucklers, unless he believes such bones homologically identical; but the names of teeth, as incisors, canines, and molars, are used in a conventional, and perhaps convenient, but not in a homologically restricted sense; the so-called canines of a seal are not the homologues of the so-called canines of a walrus; the tusk, horn, or tooth of the narwhal, also described as a canine tooth (the left canine) seems a mistake. Would it not be better to consider as homologues all succrescent teeth, or those teeth which through life continue to grow *from* the basal and *at* the distal extremity; and also as homologues all those teeth which appear to acquire maturity and become complete in a few weeks or months. I would make no rule as to the position of succrescent teeth, but seek simply to understand their structure and character; thus the incisors of a rat or rabbit, the horns or horn of a narwhal, the canines of a walrus, and the tusks of an elephant, would come into the same category of succrescents. I recollect no instance in which so-called canine teeth occur posterior in position or in addition to succrescent teeth, but there are many instances in which complete teeth occur in advance of succrescent teeth: the general rule, however, seems to be that when succrescent teeth are well developed, as in *Hydropotes*, *Moschus*, *Elephas*, *Trichecus*, *Monodon*, &c., no complete teeth precede them. I may also remark that when the males of species belonging to tribes usually bearing horns, as the deer, are exceptionally without that armature, they are provided with tusks, and I assume succrescent tusks, as a kind of compensation.

I cannot expect these crude observations to have much weight, or be received with much favour, but I think it possible they may induce some more competent naturalist than myself to investigate the matter; if so, my object will be attained.

In conclusion, I think I have said enough to show that this edition has been issued in an incomplete and unsatisfactory, although I can by no means say in a hasty, manner; yet there

can be no doubt that sufficient time has been taken to produce a work of exhaustive excellence.

EDWARD NEWMAN.

Notes on the Birds of New Zealand.

By T. H. POTTS, Esq., F.L.S.

(Concluded from Zool. S. S. 3987.)

Haast's Kiwi (*Apteryx Haastii*, *Potts*).—Little addition can be made to the previous notes which accompanied the description of *A. Haastii*. During a visit to the West Coast last summer the localities were pointed out to the writer whence the specimens now in the Canterbury Museum were procured. One was found in the bush far up the Okarita river, the other in the dense bush between the eastern shore of Lake Mapourika and the snowy range of which Mount Cook is monarch. Mr. Docherty stated that both of these birds appeared wilder than *A. australis*, and made somewhat more resistance during their capture.

Apteryx maxima, *Verr.*, is as yet amongst the desiderata of collectors. Maoris commonly assert that such a bird exists. It is stated to be as large as a turkey. A recent communication from a settler at Martin Bay gives some weight to these statements.

It is probable that other species will be added to this interesting genus; for the past two or three years we have known of the existence of a white kiwi, information concerning it having been scantily furnished at intervals by some wandering miner or prospector. Specimens have at different times been obtained from the bush in the Martin Bay district. From the descriptions that have been gathered, they are not albinos, and their occurrence has been too frequent for them to be classed amongst specimens showing a mere accidental and rare variation either of *A. Oweni* or *A. australis*; the plumage is stated to be remarkably loose, soft and flocculent. It is suggested that the name of *A. mollis* would not be inappropriate as its specific designation. A specimen of this beautiful little *Apteryx* in the Dunedin Museum has the bill slightly curved, showing an arc elevated about one-fifteenth of its length. Bill from gape to point, three inches nine lines; tarsus, two inches five lines; middle toe and claw, two inches four lines. Plumage white, extremities of the feathers more or less stained with yellowish; bristly integument at the base of the mandibles yellowish; narrow

yellowish stain round the eye; irides brown; feathers soft to the touch; habitat, bush about Martin Bay, west coast of Otago. Other examples have been obtained at Greymouth. The men who seek a living in the wilds of the south-west coast of the South Island are not given, as a class, to the study of Natural History: examples of the rarer species of our Fauna are not the specimens they care to hunt for. Not long since the writer met with a man who had probably fed on the Notornis, and had lived for two or three weeks on the rare eggs of the crested penguin. Inquiry made of a boatman at the Waitaroa concerning the eggs of a rare (perhaps unknown) petrel, or Puffinus, elicited the information that "not being pretty at all, they were hove away." A similar fate befel some eggs of the white heron, "because they would not go in the billy." *Auri sacra fames*, our noble motto, oft blunts the spirit of inquiry about all other objects. When journeying along the West Coast the writer was informed by a very intelligent Teremakau native that far to the south a black kiwi was to be met with; he described it as "all the same as the kiwi, only black." Probably this may be the bird which the Bruce Bay Maoris call the toko-weka; *Apteryx fusca* would properly distinguish this sombre-plumed species. There seems to be some tendency to dusky colours along the south-west coast, as seen in this kiwi, *Ocydromus*, &c.: the black shag, for a long distance at least, according to our observation, frequents such points as are occupied by *Phalacrocorax punctatus* on the eastern side; so also *Hæmatopus unicolor* is there found in far greater abundance than *H. longirostris*.

Spotted Shag (*Phalacrocorax punctatus*, *Sparrm.*)—The spotted shag, ocean shag, crested shag, or "flip-flap" (the "kawau" of the natives), well known to our shore-folk, is stated by ornithologists to be peculiar to New Zealand; its active movements enliven many a bluff headland or rocky inlet of our island coast line. It derives the name of the "spotted shag" from the gray feathers of its upper surface terminating in a dark green spot; some persons term it the "ocean shag," from its marine habits; it is known as the "crested shag," from the supplementary head-feathers assumed in the winter and early spring months; it is called the "flip-flap," from its habits when cruising up the harbours following shoals of fish. As gregarious as some of its congeners, it may be seen flying, swimming, fishing, or nesting, in large companies; these numbers that thus delight to live together do so peacefully, with an absence of much

of the clamour and bickering that often marks the state of living where multitudes congregate. With these assemblies life passes in alternate periods of restless activity and restorative repose; birds fly from one favourite fishing-ground to another, usually at a low elevation, keeping just above the curl of the wave; in these short trips the flight seems more direct, and the aim more decided, as to the point to be reached, than in the case of its congener, *P. Carbo*. If disturbed, as by a boat, it often, after taking wing, makes a circuit; sometimes this tour is repeated twice or thrice, never at a great height: this habit is so much a matter of course that we have often observed people calling out, "come back, come back," under the notion that the flip-flap will sail round once more. At the fishing-ground its wonderful powers of diving insure an ample food supply, and its take of fish must be astonishingly great, as a half-pound moki is soon engulfed in its capacious throat. Not content with exploring the deeps that wash the coast, it follows shoals of fish up the smoother waters of the harbours; in calm autumn days, often have we watched the still waters of our shallow bays flash with the swift motions of the flip-flap. Sometimes a solitary fisher may be noticed cruising about; when diving no particular course appears to be taken, but only the fish pursued, as one may guess from noting the places where the bird reappears after diving. When the shag's wants are supplied, and its voracity appears almost insatiable, it seeks the rocky shore or cliff, and basks on the sunlit crags till its rapid digestion relieves it from temporary repletion, and it is once more ready for sea; when on the rocks it may be noticed drying its plumage, with outstretched wings, just in the same manner as does *P. Carbo*. This shag swims low in the water; the tail is kept about level with the surface, and appears to afford great help to the bird when it essays to rise on the wing from the water: this feat is accomplished by a slow ungraceful action, three or four leaps or bounds being necessary, with the body held partly upright, before it is fairly launched in flight. When perched, the tail affords help in maintaining the almost perpendicular attitude the bird then assumes, and it keeps its equilibrium on the steepest cliffs as firmly as if supported by a self-adjusting tripod.

The site of a nesting-place is often in some sheltered nook in the cliffs, where perhaps whole rows of their structures may be observed in close neighbourhood, and frequently the position chosen is almost, if not entirely, inaccessible. Both males and

females labour in building their homes, which are often constructed of Algæ, placed on a foundation of sticks. We have seen the birds carrying quite a large bunch of material at a time, so large and cumbersome the load that they have now and then been unable to effect a landing at the first attempt; a wide circuit has enabled them to place their burthen on the spot where the nest was to be raised. As in the case of birds in many other and far-removed genera, the constructive faculty appears most developed in the female: we have often noticed her sitting on the nest carefully and deftly arranging the tufts of material brought by her mate, some portion of which is collected from a great distance. We once saw, in a strong N.E. breeze, a fine bird beating out of Port Cooper, with a large piece of stick carried fore and aft. When the nest is completed it may be about five inches high and about fourteen inches across; it soon becomes foul and loathsome (a mass of writhing maggots), with a most horrible stench.

Three eggs are laid, measuring in length two inches four lines, in width one inch six lines, of greenish white, more or less clouded with chalky white. In a brief space they become mottled and stained to an extent that quite alters their character: these marks are no doubt occasioned by the incubating bird sometimes feeding at home, as bloody smears on the eggs are not otherwise to be accounted for, unless thus painted by the fresh fish-blood on the bird's mandibles when the eggs are duly turned in the nest. The labour of incubation is fairly shared by each sex, as we have noticed that when one bird has left its charge its mate has immediately supplied its place; when alarmed on her nest the shag utters a low note, rapidly opening and closing the mandibles, which gives a peculiar throbbing appearance to the cheek. From the middle of October the breeding-season extends through the earlier summer months.

The embryo is at first flesh-coloured, and gradually assumes a darker hue on its upper surface till it reaches a dull slate-colour; the mandibles light horn-colour, darkest at the extremities, gular pouch well developed. The young, blind when hatched, is of a lead-colour, darkish about the eyes and along the centre of the back; mandibles and gular pouch flesh-colour; tips of mandibles pinkish; tarsi lighter than the rest of the body; tongue very small; pectinated apparatus of the middle claw undeveloped; the entire body naked, being utterly devoid of down or feather. The first

indication of plumage is the sprouting of the hair-like down of the tail; dark brown down next appears on the upper surface, whilst the under parts are covered with whitish down: the condition of the young always appears most thriving; the abdomen is distended as though stuffed. In the next change in the appearance of the young, we note that it has assumed a dull smoky colour, lightest on the abdomen, the chin and tarsi, the latter lightest on the inside; another change occurs before quitting the nest, the whole upper surface becoming of a dull slaty brown, almost white beneath; lore, chin and pouch purplish flesh; up to this stage the aural orifice is unprotected. When clothed with down the middle claw is still wanting in its pectinated apparatus. Whilst in the nests the young stretch up their long necks and move their heads in a snake-like manner from side to side; their note is hoarse and brief, like the woffling bark of a puppy; when of a size to fill up their home the old birds remain at the edge of the nest. Below the nests there may often be observed a substance that looks not unlike some species of coral; this is formed of the exuviae of these birds, and by the solidifying of the liquid ejections which the shag so constantly produces. A well-known sea mark near Banks Peninsula, known as "White-wash Head," owes its distinctive name to the colour it has assumed from the accumulated white droppings of this sea-fowl. It leaves its nest with reluctance, as it is not a shy bird. The position chosen for the nest is perhaps rather to secure the advantage of shelter than from the fear of depredators. Its gruff brief note is not often heard; when ashore we have noticed that it frequently opens its mandibles widely, as though the trachea was irritated by the presence of some parasite. Ticks sometimes are found firmly fixed on the throat.

It is worth noting that the plumage of the young, when they leave the nest, is of a dull inconspicuous tint, which may be of great advantage, not only in obtaining its food, by securing a nearer approach to its prey without observation, but also by its tone affording a certain amount of protection, as either afloat or ashore its colour harmonizes with its surroundings, so that it is far from being a striking object; young females up to the period of their first nest differ but little from the tints of the young state. In this state of plumage these birds most frequently visit the shallower waters of the bays in the harbours: at sea we have never met with shags far from land, hence the name of "ocean shag" does not

seem appropriate. It will be observed that the middle or cleansing claw has a slight twist, and the comb differs from that on the middle claw of *Ardea* in the case of the bird under notice; the comb really appears to be an addition carried out to the end of the claw, and is doubtless an useful and well-used instrument; it is flexible to a certain degree, and it would be more proper to describe it as a scraping instrument than a comb; in fact, it is the inside edge of the middle claw produced into a scraper of about sixteen broad curved flexible teeth.

As far as we know, the spotted shag dives from the surface of the water, not from the heights from which some of the anserine order dash on their prey; yet those who examine its structure will note how admirably its anatomy is calculated to resist the strain or pressure caused by its manner of obtaining food, the coracoid and adjacent bones being not only in themselves of great strength, but also firmly attached to the sternum. The eye, subject to so much exposure, is defended, in addition to the armature of the lore, by a circlet of round flexible plates. In life, at certain seasons, these are of deep turquoise-blue, and add greatly to the appearance of this bird.

Perhaps no other species of our *Pelicanidæ* is sooner or more completely robbed by death of so much of its beauty and character as *P. punctatus*; the evanescent colours of the membranes that decorate as well as protect certain parts of its body, and the varying tints of yellow, green, blue and purple defy the skill of the taxidermist to preserve, and fade away into the semblance of a mass of leathery wrinkles.

The changes that take place in the plumage and in the coloration of the membranous processes have led some persons to make two species of the spotted shag; but a careful study of a large series of specimens, procured at various periods of the year, and a tolerably close observation of the bird in its favourite haunts, prevents the writer from coinciding in this view. Having described the young from the embryo through several of its changes of appearance till it is of a size almost to quit the nest, we now give some notes of its state of plumage at different ages and seasons.

Young female killed in March.—Upper surface dull smoky gray, the apex of the scapulars of dull greenish brown; outer wing-coverts dull brown, edged with pale fawn; under surface white; thighs dull brown; tail-coverts dark brown; tail dark

brown, shafts white; lore and chin yellowish flesh, tarsi and feet dull flesh-colour. Female killed in August.—Upper surface dark smoky brown, with a greenish glint on the head and neck, scapulars terminating in a deep green spot; back dark brown, changing to dark green; under surface white; throat and anterior of neck pale ash, leaving a broad stripe of white from the base of the upper mandible below the eye as far as the wing; lore and chin (of fine texture) dull, rather yellowish flesh-colour; tarsi and feet dull flesh-colour. Males of the same age present no observable contrast in their plumage to that of the other sex. When this shag is about a year old the membranous processes, which are such conspicuous features, gradually lose their former texture, and become coarsely granulated; dark green spots are sparingly dotted on the wing-coverts, the throat assumes a darker hue, the white shafts of the tail-feathers are exchanged for rectrices with shafts of slaty black; the two centre feathers are the first to be replaced; tarsi and feet take a more decided tinge of yellow. In all these changes there is a remarkable want of constancy, so that to note down all the variations that may be observed in an extensive series would exceed all reasonable limits for such a paper as this.

In the nuptial plumage this common bird becomes one of the handsomest of our sea-fowl; the great and striking alteration conferred by snow-white accessory plumes that decorate the head lasts but a short time in perfection in either sex, and gradually moults away into the more sober garb of the summer plumage. In the month of August adult birds have the head greenish brown, sparingly interspersed with narrow white feathers; immediately above the forehead rises a tuft of dark brownish green feathers, while another of the same shade forms a long irregular crest just above the nape; this inclines forward, reminding one of a clown's *toupet*; on either side a line of snow-white feathers, more or less produced, extends from above the eye to the wing, meeting in a broad band below the nape; upper surface brownish gray, marked with deep green spots; back deep glossy black-green; throat blackish green; under surface leaden gray; lower abdomen, tail, and thighs deep glossy black-green; thighs often sprinkled with narrow white plumes, which, like those on the head and neck, are of temporary duration; mandibles horn-colour; lore bluish purple, the eye-circlet of turquoise-blue; chin greenish, often bluish purple, deepest at the point; tarsi and feet yellow.

Summer plumage, November.—Head, neck and upper surface dark greenish gray; wing-coverts and scapulars dotted with deep green spots; throat and neck pale gray, mottled with dull green; under surface leaden gray; lower abdomen black-green; rectrices black.

Measurements.—Bill from gape to point, three inches four lines; tarsus, two inches five lines; wing, nine inches two lines; length, twenty-eight inches. Average weight of adult birds may be fairly estimated at two pounds thirteen ounces.

When this bird is cruising in search of prey its long neck is often moved from side to side, reminding one of the habits of the nearly allied *Plotinæ*; this is observable, too, in the young nestlings: of some species of *Plotinæ* it is said that the neck is always in oscillation.

T. H. POTTS.

Zoology of the Royal Academy. By EDWARD NEWMAN.

IN the traditional art criticisms handed down to us through a period of thousands of years, we find as a matter of course much that, to our sluggish intellects, seems mythical, apocryphal, incredible. We do not, just at present, doubt that twenty or thirty centuries ago the intellect and hands of man *did* produce an Apollo or a Venus; and we are fully aware they could not do so now. The only ground of this faith is the existence of the Apollo and the Venus present with us; we can see and handle them: the ground of our want of faith in the present existence of power to produce them is simply that it is not exercised. This state of things will soon be changed. As we advance towards that higher condition on earth for which we are destined, carbonate of lime, for of such is the Apollo, such the Venus,—and we must learn to call things by their right names,—carbonate of lime will be required for more useful purposes; for instance, as an ingredient of cement, or drugs, or bread. Then will the hammer and the mill do their work: and this accomplished, the sceptics will exclaim triumphantly, “As for ancient art it is all a myth; you cannot trust these traditions; were there any foundation for them, evidence must exist: let me ask you plainly, do you believe our artists could produce such things now? If therefore, in this advanced state, we could not produce them now, how could our fathers produce them.” There is no speculation in this: Baalbec and

Palmyra, the Acropolis and the Parthenon are already mending the roads. When, therefore, we read of the glories of ancient art, it would be mere folly to doubt their approaching annihilation merely because we have now the evidence of its existence before our eyes or in our hands.

We are told that three or four thousand years ago,—that then or some still earlier period,—there were paintings representing fruit so accurately, so exactly like real fruit, that they had to be protected by wire or some similar contrivance to prevent the birds from pecking them, and thus damaging a valuable property. A kindred fact has been repeatedly asserted of the portraits of dogs, namely, that they were so life-like that living dogs would always stop in the streets where the portraits were exhibited to try conclusions with them.

Dædalus again, whom Bell, following Spence, and Spence the authors of antiquity, describes as “the most skilful artist Athens or Greece ever produced,” arrived at such perfection that his statues were said to be animated, to see, to roll their eyes, to walk, nay, would fly away unless they were chained. We who are accustomed to contemplate unmoved and in comparative indifference the pigtail of George III. in Cockspur-street, and the grand equine statue in Leicester-square, seem scarcely to see the necessity of this precaution, and therefore indulge a comforting reflection in our immeasurable superiority: we thank Heaven we are not so credulous, nor so easily “taken in.”

We are scarcely justified, however, in taking this comfort to ourselves at present. Such art treasures as remain were of a later date; those attributed to Phidias or Praxiteles, when art had been perceptibly declining through a series of centuries, fully justify the most exalted idea of their perfections, and if we could trace art history ten thousand years further back than Phidias we should probably find evidence of as great a deterioration in that famous sculptor as we now fancy we detect between him and the great Anonymus who has shed such a glory over Leicester-square. Before we venture to express doubts on such a subject we should at least reflect how immeasurably superior was the poetry, painting, sculpture and architecture of Greece to our own, as exhibited around us and in our midst, and how much better qualified was the art-historian of the period to form a correct judgment than we can possibly be at this remote period. Even our mental inability to accept such statements, and I grant we cannot accept them in their

entirety, is an evidence of our decadence. I wish no one to believe that the chaining of statues four thousand years ago was a measure rendered necessary by their quasi-vitality, but I wish every one to understand that art was then so vastly superior to what it is now as to justify a belief which to our narrower intellects and education appears utterly preposterous.

I have not the materials, nor have I space here to descant on the partial revival or renaissance of art in the days of Snyders and Weenix, Cuyp and Potter; though these and a hundred others have abundant claims to admiration as painters of animals: boars and dogs, peacocks and poultry, horses and cows,—aye, and bulls, too,—were produced with wonderful profusion and success; but their day seems to have passed, and their very names, unless in a few more prominent instances, are forgotten.

Another long period of obscurity followed, dissipated at last by the appearance of Sir Edwin Landseer: he made a mark early in life, and soon rose to be the unquestioned exponent and teacher of all that was life-like, and natural, and truthful in the representation of animals, and so he remained to the end of his life. Year after year the walls of the Royal Academy were rendered attractive by the work of his brush, and animal painting, until his time contented with a very humble position in art, gradually rose until it assumed unquestioned the highest rank. And now he is gone: time after time, visit after visit, a feeling of sickness and sorrow comes over me as I turn the leaves of the Catalogue or wander over the walls, searching for something that I know is not there. The sun of animal painting has set, and set behind a cloud; and I cannot shake off the feeling of chill consequent upon the absence of his rays: unconsciously I repeated to myself that hackneyed, but, alas! inevitable conclusion, "We ne'er shall look upon his like again." Last year he was amongst us, perhaps but as a shadow of his former self,—an echo of that talent which had for so many years spoken trumpet-tongued,—*now* there is not even the shadow, not even the echo. This feeble tribute to the memory of one who has given me such unmingled, such instructive pleasure, was a debt of gratitude I have long desired to pay.

The present exhibition is one of surpassing excellence—an excellence due to the very liberal admission of paintings by outsiders: the R. A. is not always an unchallenged order of merit;

and it is very gratifying to find so large a proportion of the pictures by artists whose names are not thus decorated. A charge of exclusiveness cannot this year, with any show of fairness, be preferred against the Council.

Mr. Richard Ansdell, R.A., is represented by five pictures, Nos. 186, 367, 520, 614 and 620; and Mr. Sidney Cooper, R.A., by four pictures, Nos. 209, 419, 474 and 713; there is nothing in these pictures to distinguish them from the previous performances of those well-known and favourite artists, who seem to have attained a position of that high respectability in English art that is not amenable to any criticism of mine.

I then come to Briton Rivière, a name undecorated by letters; it seems French, but I cannot state that its owner is so; he certainly rejoices in a very English address—16, Addison-road, Kensington. Perhaps the announcement may induce some very English readers to regard him with unprejudiced eyes. Mr. Rivière has two pictures, Nos. 260 and 527. The first is called "Apollo," and it may be incidentally remarked that the painter is in general particularly happy in describing his pictures by a single word, as Circe, Daniel, Argus, Apollo. Apollo is introduced to us with this quotation, translated from Euripides:—

"Apollo's self,

Deigned to become a shepherd in thine halls,
And tune his lays along the woodland slopes.
Whereat entranced the spotted lynxes came
To mingle with thy flocks; from Othrys glen
Trooped tawny lions; e'en the dappled fawn
Forth from the shelter of her pine-wood haunts,
Tripped to the music of the Sun God's lyre."

The usual version of this story inherited by schoolboys, through the instrumentality of L'Emprière, may briefly be stated thus:—Jupiter slew Æsculapius, a celebrated physician of those days, with a thunderbolt forged by Cyclops, a gentleman possessing but a single eye, and that situated in the middle of his forehead. Apollo was so angry at this that in turn he killed Cyclops, and for this was sent to tend the flocks of Admetus, king of Thessaly, and whilst thus employed played on his sistrum so skilfully, as a sort of solace in his banishment, that the wild beasts gathered round him to enjoy the delightful music. An idea will intrude itself that this great painter may have rather combined and confused two

stories, that of the parent Apollo, who was unquestionably the god of music, and that of his son Orpheus by the muse Calliope, the chief and queen of all the muses. It may be recollected that mythological history represents Orpheus as playing on the lyre or sistrum, as I think it is called, and by his music taming wild beasts: he was, moreover, accompanied by a tamed lion, which, however, is rather injudiciously identified with Eurydice, although the name may be fairly translated a "tamed lion." All the accessories will agree with either fable. Mr. Rivière elects to make the father the principal actor, and has selected the time when the Carnivora have settled into their "reserved seats" to enjoy the music at their ease.

The very excellencies of this picture have, I think, operated to its disadvantage: they have induced the Council to hang it on a level with the eye, almost in a corner, so that every one has the opportunity of quietly admiring its beauties, but is compelled, as it were, to magnify its defects; there is scarcely a possibility of getting to that moderate distance which a picture requires to enable one to pass a fair judgment of its effect: if you approach too near you lose the painter's intention; if you withdraw but a couple of steps a crowd intervenes and you see nothing. We are compelled to take the former course, and then it is utterly impossible to conceal from oneself that sufficient time and pains have not been bestowed on the details: it is true that we neither expect nor wish to see the toes of a lioness worked out with that consummate skill and elaborate care which Mr. Leighton has bestowed on those of the human figure in No. 348, yet we do claim for the feet of the quadruped rather more "making out" than is perceptible at this near view. For the same reason, the goats are not quite satisfactory; they are streaky, and the touches of the brush are too obtrusively prominent: this defect may probably be removed by distance, but as I have already said this distance is difficult to obtain: the fallow deer are open to the objection of formality and stiffness; they are represented as emerging in sober, sedate, wondering phalanx, from their "pine-wood haunts;" and the very rabbits are drawn from their burrows altogether unable to resist the attraction: one has scarcely emerged from his burrow, another is sitting erect, as rabbits are wont to sit when listening to any sound to which they are unaccustomed and of which the meaning is for the time incomprehensible. The Carnivora are subdued but not cowed,

tamed but not intimidated, for there is no exhibition of fear, no thought of retreat. The principal figures are a lion, two lionesses, three leopards, and a lynx, all huddled together, their soft jackets intermingled and amalgamated like those of kittens when cuddling to their mother; and nearer the front are the goats in various attitudes. There is an air of dignity about the lion that well becomes the king of beasts, but the lioness seems to be what the late Duke of Wellington called the Irish, "an imperfectly conquered people;" they are grumbling and glowering in spite of the the musical banquet provided for them: the painting of their eyes is absolutely marvellous; not being a painter, I cannot guess by what cunning device this magical effect of emitting light has been produced. It seems as though precious stones had been employed as the pigment instead of ordinary paint. There are two eyes possessing this remarkable property; the one to the left is the most brilliant and sparkling, that to the right, emitting blue-green light, the more miraculous.

"Genius loci," No. 547, a sleeping lioness, is a single figure, very massive and powerful, in perfect harmony with its surroundings, and well called *genius loci*: such studies scarcely bring out a painter's highest capabilities; perhaps it is a false yearning, but we seem to require something more poetical, more imaginative, more difficult of execution, than a sleeping lioness such as we see every day at the Zoo; but still as the representation, and a powerful one, of a sleeping lioness, the picture is very effective.

Reverting to the exhibition of 1872, I may say that Mr. Rivière has nothing now so attractive as the "Circe;" the humour in that picture was delightful, and, as I think, thoroughly French. I fear that Mr. Rivière may in his picture this year have toned down his keen sense of humour, his marvellous appreciation of life, to meet the English taste for respectability: if so he has made a mistake. An Englishman rarely ventures to attempt at drollery; it does not become him; it reminds one of the uncouth gambols of an elephant; and the sooner English painter or elephant returns to the respectable, though somewhat weighty walk of ordinary life the better we like him. How often do we not hear the French paintings called "theatrical;" they have too much action, too much life, too much fun, too much colour. Mr. H. S. Marks seems to me almost the only Englishman who successfully attempts humour in his pictures,

and with him the attempt is successful, because genuine, natural, quiet, inoffensive humour is always beaming from his canvass; he never descends to the broad grin of the clown or the uncouth posturings of the elephant. English painters painfully feel their shortcomings on this point as on many others; with them brilliant colouring is synonymous with scarlet, or more technically pink, hunting-coats, freedom of drawing with extent of canvass: all the English faults remain, though the picture be painfully overflowing with scarlet, and the canvass be measured by the acre instead of the foot.

Mr. Davis has three pictures, Nos. 270, 596 and 606. It is perhaps as unwise as it is truthful, when I say that I never prepare to look at a painting of cattle by Mr. Davis but I feel predisposed to be pleased. I have received such intense gratification from gazing on cattle painted by Rosa Bonheur and Mr. Davis that I cannot escape the conviction that I am going to receive another instalment of that pleasure, always accompanied by a corresponding amount of instruction, when I am about to gaze on another picture by either of these accomplished artists, and I have never been disappointed; therefore I suppose the same unfair partiality will continue to the end. No. 270, which is called "A French Lane," seems to me as English as the most respectable English mind could desire; it is a choice "landscape with figures," photographed in colours. I do not know what "French" attribute this lane may possess; certainly it seems as near perfection as a landscape with figures can be: the largest figure, a brown cow, or as it would be called in Herefordshire, a "red cow," is resting her nose on the back of a calf in the foreground, and both figures may well challenge comparison with anything Rosa has produced.

Mr. E. Douglas (a name with which I am sorry not to be familiar) has two pictures, Nos. 155 and 432, the first called "Old Mother Goose," seems to call for no particular comment: it is so hung as to prevent the visitor from seeing it with satisfaction, and it scarcely excites a wish to see it more distinctly; the other, "Mountain Shooting," No. 432, has the ring of true metal, and it is impossible not to be reminded of Sir Edwin: the dogs and game are equally good, but there is a softness of texture in the hair of the dogs that is more fitted for the drawing-room than the mountain side: this is a very venial fault, and will be sure to vanish hereafter.

Mr. Prinsep exhibits three pictures, Nos. 27, 274 and 943; the first and last of these contain one animal each. No. 27 is called "A Safe Confident," and represents a lady communicating her secrets to the softest and whitest of cats.

Mr. Leighton exhibits a treasury of pictures, Nos. 131, 303, 348 and 981; of these No. 131, "Moorish Garden: a Dream of Granada," comes strictly within my limits as zoological: a girl is leading two peacocks, one of them white, the other of the most resplendent hues; it is very beautiful, but this need scarcely be said of Mr. Leighton—his productions are always eminently beautiful.

Mr. Aster Corbould has been remarkably happy in selecting the finest subject for animal painting that the whole range of English poetry contains, Byron's "Mazeppa," No. 221, but I could not obtain a view of it sufficiently satisfactory to pronounce any opinion on its merits.

"A thousand horse, the wild, the free,
Like waves that follow o'er the sea,
Came thickly thundering on,
As if our faint approach to meet;
The sight re-nerved my courser's feet,
A moment staggering, feebly fleet,
A moment, with a faint low neigh,
He answered and then fell;
With gasps and glazing eyes he lay,
And reeking limbs immoveable,
His first and last career is done!
On came the troop—they saw him stoop,
They saw me strangely bound along
His back with many a bloody thong:
They stop—they start—they snuff the air,
Gallop a moment here and there,
Approach, retire, wheel round and round,
Then plunging back with sudden bound,
Headed by one black mighty steed,
Who seemed the patriarch of his breed,
Without a single speck or hair
Of white upon his shaggy hide;
They snort—they foam—neigh—swerve aside
And backward to the forest fly,
By instinct, from a human eye."

EDWARD NEWMAN.

Ornithological Notes from North Lincolnshire.

By JOHN CORDEAUX, Esq.

(Continued from S. S. 3943.)

MARCH AND APRIL, 1874.

Teal.—March 10. Wind N.N.W., heavy snow squalls and sharp frost. The severe weather has driven many wild ducks inland to the streams and drains. Shot five teal from the “beck” this morning; four of the number were males in full breeding plumage.

Pied Wagtail.—March 16. The pied wagtails came northward rather later than usual; we saw few before the commencement of the third week in March. There appears to be a constant succession of small flocks at this season in the coast districts, on the move northward.

Golden Plover.—March 18. There were many hundreds in the marshes to-day, very wild and unsettled, and constantly on the wing; they soon left again, probably for the north. In one flock of golden plover there was a single curlew sandpiper.

Greenfinch.—Observed during the first fortnight in April large flocks of small birds, entirely composed of this species, on freshly-sown oat-fields near the sea embankment. These flocks were made up of males and females in about equal proportions: they were generally employed in picking up and consuming those oats which remained uncovered, the husk being invariably rejected and the kernel only swallowed. Gizzards examined contained also many small stones and the seeds of the clover plant, sown at the same time as the oats, hundreds of these small seeds remaining exposed, or partly exposed, in the loose soil. These flocks, I believe, were migratory, and they left, almost to a day, about the 15th of the month.

Rook.—April 6. Young rooks first heard calling in nests.

Peewit.—April 6. First nest found containing three eggs. Out of the innumerable peewit-nests which for many years I have been in the habit of examining in these dry and highly cultivated marshes, I have almost invariably found the eggs deposited in the shallow nest placed on some slight, and often considerable, elevation, never in a hollow or furrow; although obviously in these latter situations the sitting bird would be in a great measure unobserved and less likely to be disturbed. In old times, when

these marshes were literally what their name implies, the peewit was probably induced to fix upon the most elevated spot as a wise precaution against floods and damp; the necessity for this has long since passed away, yet hereditary instinct continues to assert itself, and the old habit is persisted in notwithstanding modern improvements and husbandry.

Tree Pipit.—April 6. First heard; a solitary instance, for the main body certainly did not arrive till the end of the month.

Dunlin.—April 8. There are some immense flocks on the coast, the individuals comprising which have, in a great degree, put on their breeding-dress. Early on the morning of the 20th, I rode within a few yards of many hundreds of dunlin, resting near the centre of a freshly-sown field, not one of which showed any signs of seasonal change. I am therefore inclined to think they were a flock of young birds of the previous summer, which this year never fully obtain their breeding, or rather summer, plumage, and remain in flocks on the coast throughout the season, not breeding till the succeeding season. That some of our waders do not breed till the third summer, or when they are two years old, I am convinced, or why those half-plumaged flocks which we find at Spurn and on the coast throughout May, June and July?

Gray Plover.—April 8. First observed on the flats; some are already in summer dress.

Sparrowhawk.—I fancy the sparrowhawk is becoming, at least in this district, more common than it was a few years since. It is a useful bird to the farmer in one respect, as they feed largely on that agricultural pest, the wood pigeon. They also eat starlings; I recently surprised a female sparrowhawk just commencing a meal on a freshly-slain starling; the wood pigeon is, however, their favourite prey.

Snow Bunting.—April 10. Last noticed; an old bird in beautiful plumage—a most unusually late appearance.

Sand Martin.—April 10. First seen, several. This is the first occasion in this parish that I have found the sand martin arrive before the chimney swallow.

Willow Wren.—April 11. First heard.

Hooded Crow.—Large flocks (one hundred to one hundred and fifty together) near the coast on the 11th. They had entirely left before the morning of the 13th. I have not seen even a single example since this date.

Golden Plover.—April 15. Last flock seen in the marshes.

Knot and Godwit.—April 15. On their vernal migration; first flocks seen on the foreshore of the river.

Whimbrel.—April 15. First spring appearance on their passage northward; numerous towards the end of the month.

Chiffchaff Warbler.—April 18. First heard.

Chimney Swallow.—April 20. Three seen, first appearance; wind S.W.

Curlew.—April 20. Numerous on the foreshores of the Humber since the end of March. With a powerful telescope I watched from the embankment this morning a party of fifteen or twenty foraging over the ooze. They were perpetually boring into the semi-fluid mud, inserting their long scythe-shaped bills to various depths, sometimes sufficiently to daub the feathers at the base of the bill. They very rarely made a bad shot; and one bird, which more particularly attracted my notice, in ten successive probes extracted each time and swallowed a small annelid about two inches long.

Tufted Duck.—A young male tufted duck diving and feeding in the entrance to our creek; close to him on the water was a fine old mallard and his wife.

Fieldfare.—April 22. Some small flocks in plantations and hedgerows near the coast.

Yellow Wagtail.—April 24. First seen.

Cuckoo.—April 25. First heard; there was a general arrival throughout the district on this day.

Common Whitethroat.—April 28. First seen and heard, and in considerable numbers.

JOHN CORDEAUX.

Great Cotes, Ulceby, Lincolnshire.

May 5, 1874.

A Vegetarian Cat.—I have a cat in my house which devours with avidity all sorts of vegetables. Brocoli, early cabbage, sea-kale and asparagus are all in favour with the cat; and as to the latter, my servant informed me on Saturday, after I saw one of the white ends eaten with a keen appetite, that at least a dozen shared the same fate down stairs; nothing appeared to be better relished by this *castrato* cat than the stumps of brocoli, which have now yielded to asparagus; but I never before had reason to attribute in the feline tribe any tendency to indulge in vegetables. I am aware that when cats are very hungry they will eat bread.—*Edward Hearle Rodd; Penzance, April 27, 1874.*

Arrival of Summer Birds at Glenarm.—Chiffchaff, March 25th, 1874. Ring ouzel, April 5th; wheatear, 3rd; swallow, 20th; martin, 23rd; cuckoo, 23rd; common sandpiper, 26th; landrail, 16th. On the 22nd of April I observed a large flock of fieldfares migrating.—*T. Brunton*.

Spring Migration of the British Warblers.—The arrival of our summer visitors, with their welcome spring notes and songs, always suggests the query where they actually come from—I mean those who visit the British Isles and rear their young during the summer. This thought is now again suggested by a friend who, in his tour through Italy, writes me that nightingales, blackcaps, garden warblers, willow wrens, &c., are all in full vigorous song, and fill the groves with their melody. The question naturally arises, how these birds are singing in Italy, and what business they have to be there at all, and so far south, at this season? for it is generally understood that the great vernal migration draws away the family of migratorial warblers from the south to the northern countries to breed, to return again at the great autumnal migration to the southern countries of Europe, to avoid the rigours of our northern climate in winter. The question which seems to suggest itself is, whether the Polar migration in the spring is *general* or *partial*, a section of some families choosing not to move, whilst others migrate? A second question is, whether these birds in Italy in the spring, and in full song, are migrants from a still lower range of latitude, such as the northern and central parts of Africa, and are satisfied with their limited northern trip to Italy, only in the same way as those from Italy and the South of Europe (the limits of their southern migration in the autumn) aspire to a higher range, and thus visit us? Observations upon this subject from your correspondents will be interesting. What I have said is merely a suggestion from myself.—*F. H. Rodd; May 1, 1874*.

Peregrines in the Isle of Wight.—On the 30th of April I saw at a birdstuffer's a pair of magnificent old peregrines, male and female, also an immature but full-grown female,—all shot or trapped at the Freshwater cliffs about the middle of the month, when in the act of incubating, and the eggs of both nests were taken. The yearly destruction during the breeding season of this noble species is very deplorable, and there is reason to fear that ere long they will cease to frequent those lofty maritime cliffs, well nigh their last resort. The eggs even find a ready sale at prices that would formerly have secured the bird itself; though I see, in a priced list sent me from a western county, the skin of the peregrine offered at six shillings! What such a pair of falcons, in perfect adult plumage, may be worth, I cannot say, as they were not for sale, but the individual who procured them would doubtless be well compensated for all risks and dangers run. Nor do I think that any law that could be enacted would deter these depredators from robbing the nests and trapping the birds. The plumage of these old peregrines is remarkable for its perfection and purity, the

white breasts without the slightest reddish tinge, though Yarrell describes that part as rufous-white, and Morris's figure of the adult has the under parts deeply shaded with rufous. These birds are more like the figure given by Temminck, but the tail-feathers are barred beneath with white and tipped with the same,—not with rufous, as is Temminck's,—and the birds are somewhat lighter. The female is about half as large again as the male, but does not differ greatly in plumage, as far as I could see, the lower parts being thickly entwined and bandaged. The third specimen has the breast and under parts mottled with reddish brown and the general plumage dark, the markings more or less indistinct and undefined, and the under surface of all the tail-feathers barred with reddish brown and tipped with the same; whereas the female represented by Yarrell, in its second year, is said to have the external feathers only tipped with rufous. I am not aware whether its breeding in this immature state of plumage has been recorded—*i. e.* I think it must be in its second year, seeing the tail is both barred and tipped with rufous.—*Henry Hadfield; High Cliff, Ventnor, Isle of Wight, May 9, 1874*

Robins feeding Young Thrushes.—A friend of mine living near here is a great admirer of birds; this spring a pair of robins built in an old pint-pot hanging on a fence in her back garden; they lived in undisturbed possession of their nest, and were bringing up their young family very happily until about a week since, when a cat clambered up the fence, knocked the young ones out of the nest and devoured them; the servant came out just in time to see the last chick disappearing down the throat of the monster. The gardener employed by my friend was working a day or two later in a small orchard on the other side of the road; he observed two robins picking up worms and then repeatedly flying with them to a filbert-tree. Being surprised that robins should choose such a situation for their nest, he got into the tree, and discovered a thrush's nest, in which were three young birds more than half-grown; he now became more interested than ever, and watched the nest at a short distance for four successive days; the result of which was to prove to him that the robins were actually feeding the young thrushes: one thrush came from time to time to the nest with food, but never more than one. Yesterday I went and inspected the deserted robin's nest, and afterwards called upon the gardener and questioned him respecting the above facts. He thinks that the robins who have taken such a parental interest in what he believes to be a widowed thrush are the identical birds whose too great affection for the pewee has been the cause of the destruction of their family. Surely several instructive moral lessons may be gleaned from the above pathetic story. I was unable to watch the robins at work myself, as they have been again cruelly bereaved. The gardener, in his delight at the discovery which he had made, could not contain himself beyond yesterday morning, but told his

master's son all about it; this promising youth immediately proceeded to the nest, and took away the young birds, which he probably destroyed.—*A. G. Butler; Sittingbourne, Kent, May 13, 1874.*

Nesting of the Blue Tit.—In the 'Zoologist' for last year (S. S. 3527), I recorded an instance of a kingfisher nesting in a hole in an old gravel-pit at a distance from water. This year, though the gravel-pit is now in use, that very hole is tenanted by a pair of blue tits (*Parus caruleus*), and only yesterday I caught the old bird in the hole, and felt either nine or ten eggs in the nest, which was about eighteen inches from the entrance. Though many instances are recorded of the blue tit building in peculiar places, I never before heard of a site like the above being chosen.—*C. Bygrave Wharton; Bushey, Herts, May 2, 1874.*

Early Nesting of the Sky Lark.—On the 28th of April last I caught a fully-fledged young sky lark in some marshes near here. I fancy this is unusually early, as this bird is a comparatively late breeder.—*G. T. Rope; Leiston, Suffolk.*

Lesser Redpoll and Siskin.—I am quite unacquainted with the summer habits of the lesser redpoll, but in the winter numbers visit these parts, and together with the siskins—which latter are always the rarer of the two species—frequent the alders by the river, feeding upon the seeds, and in their attitudes and grotesque attributes much resemble the blue tit. They generally arrive in the cold days of October, and I have watched them climbing about and hanging upon the willows close to the water's edge; but the alders appear to be much more frequently occupied, and the birds often descend to the ground to pick up the seeds that have fallen. When disturbed the whole flock takes wing, with an interesting twitter, and after flying around for some little time will often settle upon the same tree again. I have many times noticed this, and even when shot at it is not an unfrequent occurrence for them to do the like. The little things seem very fearless of man, and a very near approach is easily attained whilst they are engaged in feeding. The pretty red breast and crown of the head is more the exception than the rule with the birds I have seen, although I have observed this decoration in a few, and especially after their first arrival. They generally leave us in March; but one season, when the spring was backward, I saw them and the siskins up to the middle of April, when the latter were in beautiful plumage and appeared to be paired, but I never could find a nest of either species, though I have been told that the redpoll did breed in this neighbourhood once, and that an egg was taken. I may also mention that both species frequent the heaps of hops at a brewery after they are thrown into the yard by the river, and in this respect again much resemble the blue tit, with which they are often associated. The foregoing remarks, be it remembered, are but observations I have made on the birds in winter.—*G. B. Corbin; Ringwood, Hants.*

Hoopoe at Knotts Green, Leyton.—It may interest your readers to hear that a fine hoopoe was seen feeding to-day for two or three hours on the lawn, about a hundred yards from the drawing-room windows, in company with starlings, blackbirds and thrushes. It was very wild, and when disturbed flew to the tops of the highest trees, and after a short time flew down again. Its action whilst feeding was very similar to that of a starling, and it appeared to extract many worms from the ground, softened as it was by a recent shower.—*H. A. Barclay; Knotts Green, Leyton, Essex, May 3, 1874.*

Cuckoo in Confinement.—In the 'Zoologist' for January (S. S. 3833) inquiry is made about a cuckoo in confinement, which belonged to myself, and I am sorry to have delayed my reply so long. Soon after I wrote that statement about my live cuckoo, it got its head between the bars of the cage and hung itself. I have made several attempts to keep cuckoos, but do not remember ever getting one to live over March, when they have died from cramp or scours. My method of feeding them has been with small pieces of lean beef dipped into water, small worms, small snails, caterpillars (not smooth green ones, as they do not seem to like them), boiled egg, and (the very best of all) meal-worms and the beetles that are found with them. I found it necessary to use a few meal-worms every day, or the bird appeared very dull. If plenty of them could be procured, say a dozen per day through the year, with the addition of other food, it would turn out successful. The birds that I have kept have always been in good plumage.—*W. Stafford; Godalming, Surrey.*

Swallows roosting on Rushes.—There are vast quantities of rushes, &c., growing in and near the river here, and as an old man once phrased it, "The spire-beds is an uncommon place for birds in the 'fall.'" At the end of summer and late into the autumn I have noticed numbers of wagtails about these reeds, in the evenings, flitting from one part of the "bed" to the other, and presenting a very pretty and interesting sight to an amateur ornithologist like myself; but the number of wagtails, though considerable, was nothing in comparison to the countless hundreds of the swallow tribe I have sometimes seen. They, as Mr. Whitaker describes (Zool. S. S. 3314), would settle down and on the least disturbance fly up in a cloud, with a noise and apparent confusion. These performances were always gone through late in the evenings, and at the time when the main body of the Hirundinæ were congregating previous to their departure. From this habit doubtless arose the supposition that many of the tribe hibernated in the mud in the bed of the river.—*G. B. Corbin.*

Prolonged Existence of a Domestic Hen without Food.—A month ago Mr. Barnard, of the 'Hand and Spear Hotel,' Weybridge, missed a fine black Spanish hen, and it was given up as lost. However, on a large heap of hay being removed from the spot where it had been placed, exactly a month and four days previously, the hen was found to have been buried

underneath the load. The poor bird was in a shockingly weak condition, and apparently almost lifeless, its comb being quite black, but food and water having been given, it speedily showed animation, and now looks very little the worse for its long fast.—*Surrey newspaper.*

Water Rail.—Mr. Griffiths, geologist at Folkestone, informs me that on the 21st April, while on Folkestone Warren, an extensive landslip adjoining the beach, he observed in a small privet bush a water rail, which allowed him to approach near enough to capture it in his hand. This, no doubt, must have been a migratory individual which had just crossed the channel, and the circumstance is perhaps worth recording.—*J. H. Gurney; April 23, 1874.*

Nesting of the Garganey and Wild Duck.—Although during the last three years at least one pair of garganeys have undoubtedly bred in our marshes, we have never hitherto been able to find their nests. However, on the 28th of April my brother nearly trod upon a nest containing several eggs. Although the old duck sat remarkably close, she had probably only just commenced sitting, as upon blowing an egg for our collection we found no indication of incubation having commenced. The nest had a very thick lining of down, and was situated upon a low piece of ground covered with reeds, which had been cut some months since and had just begun shooting again. We have since carefully abstained from visiting the spot for fear of disturbing the old bird. A single male has since been seen not far off. The same day (April 28th) we counted eleven mallards on the wing together, which looks as if we had plenty of ducks breeding close by. Since writing the above, my brother has examined the nest, and I am happy to say he found the eggs covered up and quite warm; he also saw both the old birds and several broods of young wild ducks.—*G. T. Rope.*

Caspian Tern at Birmingham.—I was yesterday on our Bolton Park Reservoir, a large piece of water of about seventy acres, and which is a favourite boating pool for the young people of Birmingham, when I was surprised to see what I at first took for a common gull, but which, upon a closer inspection, I was assured from the flight must be a tern. As I had never seen so large a specimen of the genus *Sterna*, I endeavoured to get sufficiently near to examine its principal points, in order to discover what it really was. Unfortunately I could not get within two hundred and fifty yards, and I had no glass with me, but I could plainly see a slightly forked tail; and from the size of the bird and this peculiarity, I cannot but fancy it must have been the Caspian tern, as it was altogether too large for any of the other kinds of *Sterna*, and the tail too slightly forked. I went to the reservoir this morning with my glass, intending to have a good look at the interesting stranger, but, alas! he was nowhere to be seen; but as we have several largish pieces of water in the neighbourhood we may possibly hear more of him, and should I do so I will write to you again. There were a

pair of wigeon also flying about and swimming on the water, and I saw the drake again this morning.—*W. Taylor ; Chad Road, Edgbaston, April 29.*

Lumpsucker and Whiff off the Cornish Coast.—I have to record the occurrence at Sennen Cove of two male specimens of the lumpsucker, usually known as “red lump-fish” (*Cyclopterus lumpus*). They were sent to me by Mr. John Symons, jun., in whose trammels they were taken. The female, or “blue lump-fish,” is not uncommon, but I consider the male rare. I have to-day received from a trawler three specimens of “the carter,” or “whiff,” or “lantern” (*Rhombus megastoma*, Yarrell). Couch (and Yarrell quoting him) speaks of this fish as not uncommon in Cornwall, as frequently taken on a line, and as living inshore on a sandy bottom,—all three of which qualities I doubt. I have never in all my fishing taken one, or seen one taken, on a line, nor in shallow water, and I have altogether seen very few indeed. The large prominent eye of the fish seems to me in itself sufficient to prove its deep-sea habitat.—*Thomas Cornish ; Penzance, May 9, 1874.*

The Species of Mackerel.—On the 14th instant I came across from Scilly in the steamer which brings over the mackerel for the London market. The fishing-boats reached the islands late in the day, and most of the fish were consequently placed on board the steamer in bulk, and were washed and packed on the voyage. I attached myself to one set of packers, and saw from twelve to fifteen thousand fish pass through their hands, all large fish. The result of my inspection is a strong opinion that, so far as outward differences are concerned, the distinction between the common mackerel (*Scomber Scomber*), the dotted mackerel (*S. punctatus*, Couch), and the scribbled mackerel (*S. scriptus*, Couch), cannot be maintained, and I should include the Spanish mackerel (*S. Colias*) in the list, but for its size. In the lot which I watched there were fish of every grade of marking, and a large per-centage having the sharp-pointed head attributed by Couch to the Spanish mackerel. I have no doubt that I could have picked out four fish, each of which should answer precisely to the description of one of the four fish mentioned above, and differing each largely from the other three; but I could have supplied the gaps between them with variety after variety until no one should be able to say where one species began and the other ended.—*Id. ; May 16, 1874.*

An Octopus at Plymouth.—On the 28th of April my friend Mr. Cummins, of Plymouth, kindly presented me with a fine living octopus, which he had that day caught from his yacht in a trawl-net near the Breakwater in Plymouth Sound. I immediately had it conveyed to Mr. Rogers, who furnishes marine animals for the Aquarium at the Crystal Palace, to which place he forwarded it, I believe, the next day.—*John Gatcombe ; 8, Lower Durnford Street, Stonehouse, May 7, 1874.*

Proceedings of Scientific Societies.

LINNEAN SOCIETY OF LONDON.

April 2, 1874.—J. GWYN JEFFREYS, Esq., F.R.S., in the chair.

The following paper was read:—"On the Morphology of the Skulls in the Woodpeckers (*Picidæ*) and the Wrynecks (*Yungidæ*)." By Mr. W. Kitchen Parker. (Communicated by the President.) The present paper is one of a series in hand, in which the writer has endeavoured to work out thoroughly the facial characters of certain types of birds, in harmony with the view given by Professor Huxley in his well-known paper 'On the Classification of Birds' (Proc. Zool. Soc., April 11, 1867). His own mode of research is much more like that followed by the distinguished author of that paper than that pursued by ornithologists proper. Without undervaluing their excellent labours, yet there are many things which are seen first and first understood by the embryologist, and not by the zoologist as such. Professor Huxley, in the paper just referred to, separated the forms now under consideration into his group 'Coleomorphæ,' and gives (p. 467) a very valuable summary of their characters. It was sought in that paper to bring into more or less zoological contiguity such birds as have a similar structure of the facial and, especially, of the palatal bones. The group-terms 'Schizognathæ' (p. 426), 'Dromæognathæ' (p. 425), &c., are very important, although some of them are of very wide application. It was the first thought of the author of this paper that the woodpeckers would easily find a place amongst the non-passerine aerial birds; but examination of their palatal structures soon dispelled this opinion. They are more allied to the 'Passerinæ' than most of the Zygodactyles; but it is in the embryos of that type, and not to the adult, that they are related. The 'Passerinæ' themselves are well termed 'Ægithognathous' (p. 450). This huge group is in hand at present. Large materials have been added to the stores of the writer by Mr. Osbert Salvin, who also has assisted greatly in the matter of the *Picidæ*. He is also indebted to Dr. Murie, Mr. D. Bartlett and Mr. W. J. Williams. Most of the non-passerine birds that seem to come nearest to the woodpeckers have a very solid palate; they are 'Desmognathous;' others, as the humming-birds and goatsuckers (*Caprimulgus*), are 'Schizognathous;' whilst the swift (*Cypselus*) is as perfectly 'Ægithognathous' as the swallows. But the woodpeckers retain their non-coalesced condition of the palatal structures which we see in the lizards, very unlike that great fusion of parts towards the mid-line which occurs in most of the higher birds. They have also an unusually arrested condition of the palatal part of the upper jaw-bone (maxillary), which is characteristic of the lizard, and unlike the bird-class generally—and bones superadded to the palate ('vomeres,' 'septomaxillaries,' &c.); these are persistently in paired groups,

more in number, and altogether more evidently embryonic and Lacertian than the homologous parts of other birds. The writer therefore seeks to introduce a new morphological term for these birds as a group, having relation to their face, namely, the term 'Saurognathæ;' for none of Professor Huxley's terms is appropriate for this type of palate. The writer has been able to work out these parts in the nestlings of *Yunx torquilla*, in four stages of *Gecinus viridis*, in the young of *Picus minor*, and in the adult of *P. major*, *P. analis*, *Hemilophus fulvus* and *Picum minutus*."

April 16, 1874.—H. TRIMEN, Esq., M.B., in the chair.

A letter was read from Prof. Parlatore, of Florence, inviting the Society to send representatives to the International Horticultural and Botanical Congress to be held in that city in May. On the motion of Mr. A. Murray, seconded by Prof. Thiselton Dyer, Dr. Masters, Mr. George Maw and Mr. Hiern were accredited by the Society to the Congress.

Mr. A. Murray exhibited some remarkable specimens of silicified wood from N.W. America, one of which had a peculiar charred appearance. Prof. Thiselton Dyer remarked that Mr. Murray's specimens were extremely similar to the silicified wood of Lough Neagh (*Cupressoxylon Pritchardi*). The specimens with a deeply discoloured interior, he thought, had not necessarily undergone anything like charring from fire, but had probably been partially converted into lignite by slow decay before silicification. The Lough Neagh wood was attributed to the Miocene, but the fragments were found imbedded, like Mr. Murray's specimens, in a clay, and this was of late Tertiary age. Prof. Busk compared the substance to jet, and described a bed of lignite in the North of France in which a similar phenomenon was presented, the interior part of the wood being converted into charcoal, while the exterior part retained its original condition.

The following papers were then read, *viz.*:—"Contributions to the Botany of H.M.S. 'Challenger' Expedition." Communicated by Dr. Hooker. Nos. III. to XIV. "Notes on Freshwater Algæ collected in the Boiling Springs at Furnas St. Michael's, Azores, and their neighbourhood." By Mr. H. N. Moseley. In the valley of Furnas are two distinct sets of hot springs—one at the village, and the other at a distance of two or three miles, on the shore of the lake. In the principal one of the springs at the latter locality ebullition is constantly going on, and no Algæ were found in it. At a short distance is another spring of sulphurous, intensely hot, but not boiling, water; and the water is here covered to the depth of almost one inch and a half by a shining substance composed entirely of *Oscillatoria* mixed with a *Botryococcus* and a few skeletons of *Diatomacæ*, including a species of *Navicula*. Close by these sulphurous springs are shallow pools of hot water edged round with a *Botryococcus*. At the other set is a sulphurous spring of boiling-hot muddy water. Immediately below is a

swamp of hot mud, also full of *Botryococcus* unmixed with *Oscillatoria*. The exact temperature of the hot springs was not taken. The *Algæ* appear to resemble those described by Rabenhorst as growing in warm springs in Europe. In a warm stream of about 95° F. a *Conferva* was found growing amongst the fibres of a moss. The neighbouring lake of Furnas contains several patches from which sulphurous gas is discharged, and is rich in various *Algæ*, such as *Nostoc*, *Oscillatoria*, *Hydrodictyon*, &c. "Note on the foregoing communication." By Prof. Thiselton Dyer. The Diatoms sent home by Mr. Moseley were submitted to the Rev. E. O'Meara, who found them to belong to species of the most frequent occurrence in fresh water, apparently in no way affected by the high temperature of the water.

May 7, 1874.—G. BUSK, Esq., Vice-President, in the chair.

Mr. J. R. Jackson exhibited a piece of copal from Zanzibar riddled by ants. After having been some time in the Kew Museum, the living creature was found in the copal and sent to Mr. F. Smith, who determined it to be a species of *Termes* or white ant, *Eutermes lateralis* of Walker. Great interest in the specimen presented was expressed by entomologists present, who had never seen a white ant alive, Mr. R. M'Lachlan remarking that a species introduced in this way to the Botanic Gardens at Vienna had become a great pest in the hothouses.

The following paper (amongst others) was read:—"On some Atlantic Crustacea from the 'Challenger' Expedition." By R. v. Willemoes-Suhm. Communicated by Prof. Wyville Thomson. Among the many deep-sea crustaceans which have been brought up either by the dredge or the trawl during the 'Challenger's' cruise in the Atlantic, the most interesting are described in the present paper—in addition to descriptions of both sexes of the interesting *Nebalia* from the shallow water of Bermuda, some remarks on the male and the structure of *Cystosoma* (*Thaumops*), and some additions to our knowledge of the natural history and development of a land-crab from the Cape-Verdes Islands. More detailed descriptions of these forms are given than in the papers already printed elsewhere, as well as an attempt to settle their systematic position. The paper is divided into seven parts, as follows:—(1) On a blind deep-sea Tanaid; (2) on *Cystosoma Neptuni* (*Thaumops pelucida*); (3) on a *Nebalia* from Bermudas; (4) on some genera of Schizopoda with a free dorsal shield; (5) on the development of a land-crab; (6) on a blind deep-sea *Astacus*; (7) on *Willemoesia* (Grote), a deep-sea Decapod allied to *Cryon*.

ZOOLOGICAL SOCIETY OF LONDON.

April 21, 1874.—The Viscount WALDEN, F.R.S., President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of March, 1874. Amongst these

particular attention was called to a scarce parrot (*Chrysotis Finschi*), of which a specimen had been presented by Mrs. Chivers.

A communication was read from Mr. Morton Allport on the capture of a grilse in the river Derwent, in Tasmania, showing that the salmon had really been successfully introduced into the colony.

Communications were read from Dr. J. E. Gray, "On the very young of the Jaguar (*Felis (Leopardus) onca*);" "On the short-tailed Armadillo (*Muletia septemcincta*);" "On the young of the Bosch Vark (*Patomochærus africanus*) from Madagascar;" and "On the skulls of the Leopard in the British Museum."

A communication was read from Dr. O. Finsch, containing the description of a new species of penguin, from New Zealand, which he proposed to call *Eudyptula albosignata*.

Mr. Edwin Ward exhibited the skull and horns of a fine specimen of the Persian stag (*Cervus Maral*) from the Crimea.

A communication was read from Capt. W. H. Unwin, containing an account of the breeding of the golden eagle (*Aquila chrysaetos*) in North-Western India.

Mr. J. E. Harting read a paper on a new species of *Tringa*, from St. Paul's Island, Alaska, which he proposed to name *Tringa gracilis*.

A communication was read from Lieut. R. Wardlaw Ramsay, giving the description of an apparently new species of woodpecker, which he had obtained in a teak-forest, about six miles to the north of Tanghoo, in British Burmah. Mr. Ramsay proposed to name it *Gecinus erythropygius*.

Messrs. W. T. Blandford and H. E. Dresser read a monograph of the genus *Saxicola*, *Bechstein*, being an attempt to reduce into some order the excessively confused nomenclature of the species composing this genus.

May 5, 1874.—Dr. E. HAMILTON, Vice-President, in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of April, 1874, amongst which were a Vigne's sheep (*Ovis Vignii*), presented by Captain Archibald; a white-cheeked flying squirrel (*Pteromys leucogenys*), presented by Mr. A. Gower; a new kangaroo (*Halmaturus luctuosus*), deposited by Sig. L. M. d'Albertis; and four bladder-nosed seals, presented by Captain D. Gray and Captain Alexander Gray.

Mr. Selater made some remarks on the cassowary, living in the Society's Gardens, hitherto called "Kaup's cassowary," which, it appeared, ought to bear the name *Cassuarius papuensis*.

Mr. Selater announced that Her Majesty's Government had consented to send a naturalist to Kerguelen's Land to accompany the Astronomical Expedition shortly proceeding there, and that the Rev. A. E. Eaton had been selected by the Royal Society for the post.

Mr. Blandford exhibited and made remarks on a series of heads of the ibex of Persia, which he considered to be referable to *Capra ægagrus*.

Mr. A. H. Garrod read a paper on the anatomy of the Columbæ, in which a new arrangement of that group of birds was proposed, based upon certain points not hitherto sufficiently investigated.

A communication was read from Dr. Julius Haast, containing the description of a new species of *Euphysetes* (*Euphysetes Pottsii*), a remarkably small Catodont whale, which had occurred on the coast of New Zealand.

A communication was read from Mr. Frederick Moore, containing a list of Diurnal Lepidoptera collected in Cashmere by Captain R. B. Reed, 12th Regiment, with descriptions of new species.

A communication was read from Mr. A. G. Butler, containing a complete list of the known Diurnal Lepidoptera of the South Sea Islands.

Mr. Howard Saunders read a paper on the gray-capped gulls, in which several species hitherto confounded were distinguished.

A paper was read by Dr. A. Günther, entitled "A Contribution to the Fauna of Savage Island," in which several new lizards peculiar to this remote Pacific Island were described, and other animals found in it were mentioned.

A communication was read from Dr. J. S. Bowerbank, containing the sixth part of his "Contributions to a General History of the Spongiadæ."

Mr. R. B. Sharpe read a paper on a small collection of birds made in Bulama, one of the Bissagos Islands, West Africa, by Lieut. Bulger.

ENTOMOLOGICAL SOCIETY OF LONDON.

May 4, 1874.—Sir SIDNEY SMITH SAUNDERS, C.M.G., President, in the chair.

Additions to the Library.

The following donations were announced, and thanks voted to the donors:—"Proceedings of the Royal Society," no. 151; presented by the Society. 'Verhandlungen der k. k. zoologisch-botanischen Gesellschaft in Wien,' xiii. band; by the Society. 'Proceedings of the Linnean Society of London,' Meetings 19th March and 2nd April; by the Society. 'Tijdschrift voor Entomologie,' 2nd ser. viii.; by the Entomological Society of the Netherlands. 'Sepp's Nederlandsche Insecten,' 2nd ser. iii. nos. 13—24; 'Schetsen ten gebruike bij de Studie der Hymenoptera,' i.—iv.; by the Author, Dr. S. C. Snellen von Vollenhoven. 'L'Abeille,' tome ix. livr. 9; by the Editor. 'The Canadian Entomologist,' vol. vi. no. 3; by the Editor. 'The Zoologist' and 'Newman's Entomologist' for May; by the Editor. 'The Entomologist's Monthly Magazine' for May; by the Editors.

By purchase.—'Catalogus Coleopterorum hucusque descriptorum synonymicus et systematicus,' autoribus Dr. Gemminger et B. de Harold, tom. x.

The Entomological Society of the Netherlands presented a well-executed medal, struck in honour of Dr. S. C. Snellen von Vollenhoven, on his retirement from the office of President, which he had held for twenty years.

Election of Members.

G. T. Porritt, Esq., of Huddersfield (hitherto a Subscriber), and Herbert Goss, Esq., of Brighton, were balloted for and elected Members of the Society.

Exhibitions, &c.

Mr. Butler exhibited an example of arrested development in a peacock butterfly, bred from the chrysalis, caused by the tail of the pupa having become detached during the process of emerging; the right wings were completely developed, whilst the left wings had not developed at all, the pupa-case remaining attached to the left side of the body of the butterfly.

Mr. W. C. Boyd exhibited specimens of *Solenobia inconspicua*, taken in St. Leonard's Forest, and amongst them a specimen, taken at the same time, of a remarkably pale colour, which might possibly be an albino variety, but had a very different appearance from the ordinary form.

Mr. Boyd also exhibited some leaves of the common comfrey (*Symphytum officinale*), gathered at Cheshunt, the under sides of which were found to be completely covered with specimens of *Brachycentrus subnubilus*. There appeared to be some hundreds of specimens closely packed together, and they were all dead, or in a moribund state, when found. All were said to be males, but on close examination a single female specimen was discovered amongst them. No explanation could be given as to the object of their congregating together. Mr. Stainton remarked that there were many such instances of a habit of congregating amongst insects, which were equally unaccountable, and as an instance he mentioned a fact known to all breeders of Micro-Lepidoptera respecting the pupation of the greater number of the Nepticulæ, the larvæ of which live solitary as leaf-miners; but if a number of leaves, containing larvæ, are collected and placed together in a box, it is found that the cocoons are constructed gregariously between certain leaves, without any apparent reason for the preference.

Mr. Charles O. Waterhouse read the following note by Dr. Lamprey, Surgeon-Major of the 67th Regiment, on the habits of a boring-beetle found in British Burmah. A specimen of the insect was exhibited, and also two portions of stem which had been operated upon. The insect was one of the Bostrichidæ belonging to the genus *Sinoxylon*.

"On examining the plants in my garden one afternoon, I was struck with what appeared to be an injury done to one of the trees, the name of which I do not know,—this being the winter season, no blossom apparent, and nearly all the plants new to me. The branches of this particular tree are straight, grow upright, and are about half-an-inch to an inch in their

diameter. One of the tallest of these branches, which reached to a height of about eight feet, was apparently broken and lying on the other branches as if it was cut or broken off in a mischievous way. I was on the point of questioning the gardener about it, when I observed the leaves of another branch quite withered, and, on taking hold of it to bend it towards me, it snapped in a curiously brittle manner. Looking at where it was broken, I found the stem to be completely severed with a clean division, and that it was only kept together by the thin outer layer of the bark. Examining another branch, I found it snapped in an equally mysterious way, but in doing so a small black insect fell out of the broken part; it was too rapid in its movements, and I lost it. On further examination of the broken parts, and putting them into position again, I found a small circular opening, about the size of the hole in the gall-nut, and concluded that the insect I saw had eaten its way into the stem, and by devouring the wood completely round, and not along its long axis, accounted for the fracture in this particular locality. Since then I have been on the watch to discover the insect, and have succeeded in securing two specimens; one was found in the stem on breaking it across in the position of one of the external apertures: this specimen is somewhat injured by the loss of one of its elytra. The other specimen I found had buried itself so far into the stem as just to leave its posterior part exposed. They are both beetles, about a quarter of an inch in length, black in colour, and have a large head of peculiar shape, well adapted, no doubt, to contain powerful muscles and mandibles for tearing the tough woody fibre of the stem of the plant; but I leave their description to the entomologists. The office these creatures are no doubt intended to fulfil in Nature's economy is to assist in keeping the tropical vegetation in check. They burrow into the stem of the tree, are rewarded by the sap and nourishment it affords, and are liberated, after performing this task, by a gust of wind snapping the undermined and weakened stem across. They are not found in other trees or shrubs than the one alluded to. The beetle turns on his side while boring, his back being towards the bark; in this manner his form suits the circumference of the stem."

Mr. M'Lachlan referred to a specimen of a fly (one of the Syrphidæ), which he had exhibited at the meeting of 7th July, 1873, as a strongly-marked instance of gynandromorphism, the sexual organs on the under side of the abdomen being placed on one side instead of the middle. He had since been informed by Mr. Verrall that this was an error, and that the apparent want of symmetry in those organs was usual in the species. Mr. Verrall, who was present, stated that the insect was a male specimen of *Chrysotoxum festivum*.

New Parts of 'Transactions.'

Part II. of the 'Transactions' for 1874 was on the table.—*F. G.*

Collected Observations on White's Thrush (Turdus varius of Pallas). By EDWARD NEWMAN.



WHITE'S THRUSH (*Turdus varius*).

FEW birds have excited more interest, or evoked more controversy amongst us, during the last few years than White's thrush. Its distinctness as a species has been frequently called in question; some have supposed it a variety of the song thrush, others have suggested that it is the young of the missel thrush; but neither of these solutions has found favour in the eyes of our leading ornithologists, who, I believe, without exception, admit that it is perfectly distinct from any other recognized British or European species.

It was first minutely described as British by Mr. Eyton, who, in 1836, assigned it the name of *Turdus Whitei* (as a tribute of respect to the memory of Gilbert White), at p. 92 of his work on the 'Rarer British Birds;' afterwards by Mr. Yarrell, in the second edition of his 'History of British Birds;' by Mr. Tomes, at p. 379 of the 'Ibis' for 1859; by Mr. Sclater at p. 3041 of the 'Zoologist' for 1872; and finally by Mr. Rodd, at p. 3880 of the volume of the 'Zoologist' for 1874; and Prof. Newton has given an exhaustive summary of its bibliography, at p. 251 of his first volume of the

fourth edition of Yarrell, under the name of *Turdus varius* of Pallas, with which it is now supposed to be identical. It was described by the last-named illustrious naturalist, in 1811, at p. 449 of the first volume of his 'Zoographia Rosso-Asiatica.' To these I have now added an original figure from a photograph of the latest obtained specimen, kindly given me by Mr. Rodd, of Penzance.

Turdus varius is described and figured, in his 'Zoological Researches in Java,' by Dr. Horsfield, who says, "It inhabits the thick forests which cover the mountain Prahū, and, as far as my observations extend, it never leaves a region between six and seven thousand feet above the level of the ocean. On this circumscribed region it is extremely abundant. Its food consists of insects and worms. It is easily surprised by the natives. During my last visit to the mountain I obtained, in the course of a few days, a great number of individuals. I never found it in any other part of Java."

Mr. Swinhoe says that at Amoy, in China, where it is an extremely rare visitant, it only appears in spring, when the banyan berries are ripe; but he also found it in Formosa; and Mr. Gould has received an example from Manilla.

It is again described by Macgillivray, at p. 146 of the second volume of his 'History of British Birds,' published in 1839. He gives it the new and not inappropriate name of "variegated thrush." Mr. Macgillivray adds the following note from Mr. Yarrell, which I have read with much interest:—"That gentleman [Mr. Yarrell] has been so kind as to inform me, in answer to my inquiry, that 'from the differences found on a comparison of Lord Malmesbury's specimen with those from Java in the collection of the East India Company (he is) induced to consider *Turdus varius* of Dr. Horsfield as distinct from White's thrush. Two or three specimens,' he adds, have turned up lately which are also considered distinct."

It is described by Mr. Gould in the second volume of his 'Birds of Europe,' with a figure on plate 81, which Temminck pronounces, at p. 602 of the fourth volume of his 'Manuel d'Ornithologie,' "figure parfaite," calling the bird "Merle varié ou de Withe" and "*Turdus varius* seu Withei." Again, in his last work, the 'Birds of Britain,' Mr. Gould describes it as *Oreocinclā aurea* of Holandre.

Supposing, however, for the sake of convenience, all the specimens to belong to a single and singularly vagrant species, whose migrations, if any, are unknown, whose habits are obscure, and

whose appearances in Europe and Britain are purely accidental, or is otherwise governed by laws of which we are profoundly ignorant, I shall proceed to enumerate the published records on this subject.

At p. 100 of his valuable 'Handbook of British Birds,' Mr. Harting has, with his usual care, enumerated twelve records of the occurrences or appearances, real or supposed, of White's thrush in the British Isles; and I have made this my guide in the following notes, adding particulars for which he had no space, and also introducing two very important records—one of Dr. Tristram having observed the species at Greatham, the other of Mr. Rodd having obtained a specimen in Cornwall.

1. The first known British specimen is that described and named by Mr. Eyton; it was a male, and was shot in January, 1828, by Lord Malmesbury at Heron Court, his lordship's seat, near Christchurch, in Hampshire: this is also the specimen figured and described by Mr. Yarrell.

2. The second specimen is introduced to us by Mr. Yarrell, whose note on the subject I extract entire, appending a doubt by Professor Newton, which will cause ornithologists to hesitate in accepting this specimen as British. Mr. Yarrell's record runs thus:—"To Mr. Jesse I am indebted for an introduction to his friend Mr. Bigge, of Hampton Court, who has allowed me the use of a specimen of a thrush which appears to be identical with Dr. Horsfield's thrush from Java, and also with specimens from Australia, which are certainly very closely allied to the Javanese thrush. Mr. Bigge's bird is said to have been shot in the New Forest, Hampshire, by one of the forest keepers, who parted with it to a bird-preserver at Southampton, of whom Mr. Bigge bought it for his own collection. * * * * Mr. Bigge's specimen is eleven inches and a half long; the wing five inches and a half; the first feather short; the second as long as the sixth; the third, fourth and fifth of equal length and the longest in the wing."—*History of British Birds*, third edition, vol. i. pp. 203, 204. Professor Newton's commentary on the above runs thus:—"It will be observed that no notice has been taken of a thrush mentioned in former editions of this work as being the property of Mr. Bigge, then of Hampton Court, but now of Debden Hall, Essex, who, about the year 1825, bought it of a birdstuffer at Southampton. This specimen was said to have been shot in the New Forest by one of the keepers. It was

unfortunately sold in 1849 with the rest of Mr. Bigge's collection, and that gentleman, though he has most obligingly made every inquiry, has failed to trace it. It is evident that it was not a White's thrush, for, as described in former editions of this work, it had the second primary as long as the sixth, a character which equally precludes it, in the Editor's belief, from having been an example of Horsfield's thrush; while he has been very kindly informed by its former possessor that, though he had no reason to doubt the bird-stuffer's story, the specimen when shown to Mr. Gould, who still remembers the fact, was found by him to have its head stuffed with wool, as was often the case with bird-skins prepared in Australia. On the whole, therefore, it seems not improbable that, though no fraud may have been intended, the specimen may have been brought from that country, and is most prudently to be omitted from further consideration."—*History of British Birds*, fourth edition, vol. i., p. 256. It must not, however, be omitted that Mr. Harting adds a second authority for this specimen, as follows:—"Wise, New Forest, p. 314."

? 3. Mr. Allman, at p. 378 of the eleventh volume of the 'Annals of Natural History,' states he "is in possession of a specimen of this very rare bird, obtained about ten days previously [*i. e.* previous to the 15th of December, 1842] in the neighbourhood of Bandon, county of Cork." Mr. Thompson, who cites Mr. Allman's communication, adds, "It is said, in the 'Fauna of Cork,' that the gentleman at whose place the bird was obtained, saw what he believed another of the same species there; but when is not mentioned."—*Natural History of Ireland*, vol. i. p. 129. This specimen "wants the head and neck," and on a comparison with a thrush from Nepal, supposed to be of the same species, and "wanting the legs," exhibited the following differences:—"The tail of the Irish bird in length and size generally exceeds that of the Nepal bird; the quill-feathers of the wing are all longer." In colouring and marking the two birds are similar, "agreeing with the descriptions and figures in Eyton and Yarrell, with the exception of the unimportant difference of the Irish one being the deeper in tint, owing, it may be presumed, either to its being killed sooner after moult or being less exposed to the sun or weather than the Nepal bird." I take the liberty to express a doubt as to the propriety of considering the specimen a decided example of the species. Its remains are now in the Museum of Trinity College, Dublin.

4. "Between the 6th and 26th of January, 1859, a specimen was several times observed at Welford, near Stratford-on-Avon, and having been killed, is now in the collection of Mr. R. F. Toms, of that place, who, unlike most ornithologists, was not content with merely announcing the bare fact, but in doing so ('Ibis,' 1859, p. 379) contributed some excellent remarks on the structure and affinities of the species."—*History of British Birds*, fourth edition, i. p. 252.

5. At p. 2019 of the 'Zoologist' for 1870, Mr. H. Blake-Knox, one of the most talented, observant and zealous ornithologists that Ireland has ever produced, incidentally mentions that a specimen of White's thrush was shown him by Mr. Glennon, by whom it was stuffed. Mr. Blake-Knox subsequently (Zool. S. S. 2060) kindly handed me the following details:—"It was shot in the spring of 1867 by the Honourable King Harman, of Newcastle, Ballymahon, who mistook it for a small hawk or cuckoo. I examined the bird myself at the stuffer's, Mr. Glennon, of Wicklow-street, Dublin, in 1867; but as I did not see it in the flesh I must admit I did not give it as much attention as I ought."—*H. Blake-Knox, in Zool.* l. c. I much and often regret that Irish naturalists do not regularly send me records of rare species of animals occurring in Ireland: since the lamented death of Mr. W. Thompson, of Belfast, there is a sad gap in this important branch of Irish Natural History.

6. Mr. Cecil Smith records, at p. 2018 of the fifth volume of the Second Series of the 'Zoologist,' that on the 7th of January, 1870, a bird of this species was shot at Hestercombe, Somersetshire, by Mr. Beadon, of Yatton, who mistook it for a woodcock. "The bird agreed closely with Yarrell's description, except that the legs and toes—scarcely faded at all when I [Mr. C. Smith] first saw them—were yellowish brown instead of pale brown; the claws considerably paler than the legs and toes, but still tinged with yellowish brown."

7. "One, Almondbury Bank, near Huddersfield; Beaumont, 'Huddersfield Naturalist,' i. p. 217."—*Harting's Handbook of British Birds*, p. 100.

8. One was obtained on the 6th of January, 1871, at Langsford, near the Mendip Hills: it was in open ground, but near a wood, and was shot when feeding on hawthorn berries. Mr. Cecil Smith, who records this occurrence at p. 2607 of the 'Zoologist' for 1871, satisfied himself that the specimen was correctly named, and that it was not a foreign specimen made up for sale.

9. At page 2848 of the 'Zoologist' for 1871, Mr. Gunn, of Norwich, has given a most minute description and measurements of a specimen killed by Mr. F. Borrett in a marsh in the parish of Hickling, but leaves us in uncertainty as to the time of the occurrence by writing "10th instant," and not dating his letter. As the terms "instant," "ultimo" and "proximo" convey no idea whatever to the mind of the reader, I trust my correspondents will henceforth oblige me by discontinuing to use them: the date was the 10th of October, 1872.

10. In the 'Field' of February 2, 1872, there are two notes on the occurrence of a specimen of White's thrush in Castle Eden Dene on the 17th of January, 1872, communicated by Mr. Sclater and Mr. Johnstone; and these were reprinted in the 'Zoologist' (S. S. 3019). The following passage is very interesting:—"On the 17th of January last Mr. Burdon was shooting in the Dene, when a bird came across him, and, not knowing what it was, he fired and hit it, but it could not be found. He, however, picked up a wing-feather and some breast-feathers, which he brought home. On the 31st, a fortnight afterwards, Mr. Burdon was shooting over the same ground, and came upon the bird, and after being chased for some distance it was finally captured by one of the watchers, apparently but little the worse, excepting that the whole of the primary feathers of one wing were shot off, which stopped the bird's flight. It was brought home, put into a cage, and as it eats well I hope to be able to keep it alive."—*John Sclater*. At p. 3041 Mr. Sclater informs the readers of the 'Zoologist' that this bird died on the nineteenth day after its capture, having received greater injuries from shot than was at first expected. "The shoulder-bone," says Mr. Sclater, "had been broken from the blow of the shot (as the flesh was not shot through); it had strongly knit together, but was half an inch shorter than the other: the bird was a male, was very bold, and fed from my hand three days after it was caged. It ate well up till the day it died, and would no doubt have lived but for the injuries it had received. It once or twice gave a harsh scream when handled, but I heard no note; it used the perch, always roosting upon it. The markings were all well defined and alike on each side, so far as its damaged state would allow me to judge, the primaries being all shot off one wing; the third feather of the other wing was also gone, and there were only eight feathers left in the tail." Then follows a most minute description of the bird,

contrasting it with a young specimen of the missel thrush, and showing very important differences.

11. The last record of White's thrush as a British bird is from the pen of Mr. E. H. Rodd, whose valuable contributions on Ornithology have enriched every volume of the 'Zoologist' from its commencement. This record is published in the February number for the present year. The specimen was killed by one of the keepers of Mr. T. C. Hawkins, of Trewithen, in the parish of Probus, on the 13th or 14th of January, and was presented to Mr. Rodd through the courtesy of Mr. Trethewey, Mr. Hawkins' steward, who at once perceived that the bird was different from any other thrush he had ever seen: this gentleman, writing to Mr. Rodd, says:—"This bird had attracted the notice of the keeper for some weeks before he had an opportunity of shooting it. Each time he saw it, it was feeding in some marshy ground near some ponds, and when disturbed it flew to another portion of the water. The keeper thought it was a species of water-fowl. The cry was very much like that of the common thrush, but the habits quite different." Mr. Rodd, who gives this account in the February 'Zoologist' (S. S. 3880), says that this bird so exactly corresponds with Mr. Yarrell's description of the species that there is no necessity of describing it afresh. I may add that the total length of the bird is twelve and a half inches, and the extended wings measure twenty and a half inches; also that there were fourteen feathers in the tail, a character which most authors describe as distinctive of the species.

In addition to the specimens actually "obtained" several others may be mentioned as "seen." Of these there are three good instances.

1st. The Rev. J. C. Atkinson, a first-rate ornithologist, says:—"My attention was drawn to the bird yesterday (Sunday) morning. It was on the grass-plot, not ten yards distant from my study-window, and I was enabled almost immediately to examine it thoroughly by the aid of a very excellent double field-glass. I suppose it was thus under observation from two to three minutes. Again in the afternoon, from the same window, I had a like opportunity of inspection, and as the bird hopped across the grass, it came under my observation from another window, with nearly equal advantage to the observer. It remained in sight four or five minutes this second time. I had no doubt from the moment I caught sight

of it that it was not a common bird, and directly I had it in the field of the glass I recognized the peculiar plumage of *Turdus Whitei*.”—*Zool. S. S.* 2142, *quoted from the ‘Field.’*

2nd. Lord Clifton records, at p. 2845 of the ‘*Zoologist*’ for 1871, that on the 5th of January of that year, he saw a bird which, on rising from some dead leaves in a wood, he mistook for a woodcock, to which its flight, or the shape of its wings, or both, gave it a marked resemblance. His lordship continues:—“On my advancing to the spot the bird again rose from some dead leaves further on, and settled on a low tree near me. I then saw that it was of the thrush family and resembled the missel thrush in size, though differing so remarkably from that bird in flight and habits. Disturbed from the tree, the bird flew off with the same rapid, low, woodcock-like flight to another tree, perching on a very low branch, and then dropping down among the dead leaves again. My own opinion is that this bird was White’s thrush, but I do not wish to force this opinion on your readers. I would merely remind them that the woodcock-like flight and terrestrial habits are among the characteristics noted by Mr. R. F. Tomes in his description of White’s thrush.”

3rd. “Dr. Tristram, of Greatham, tells me he saw a White’s thrush on the 10th of April last; it alighted on a tree close to his house; he was only a few yards from it, and plainly saw the crescentic markings. A pair of missel thrushes immediately began to bully and chase it about the lawn, when it flew away southwards. Dr. Tristram thinks this may have been the mate of the bird obtained on the Dene here.”—*John Slater, Zool. S. S.* 3148.

I have next to trace its European and extra-European range from Temminck, who leaves us to call it by the specific name of *varius* of Pallas or *Withei* of Eyton; the latter I presume to be intended as a correction of the word *Whitei* employed by Eyton, Gould and Yarrell. This learned ornithologist, in the first place, expresses his conviction of the specific identity of the examples from Japan, the Isles of Sunda and Australia. “No other character than that of a slight difference in the size of the beak is available for distinguishing the two races of this species, one of which inhabits Japan, but occasionally makes its appearance in Europe; the other is found scattered from the Isles of Sunda as far as New Holland; the latter have the beak a little longer, and sometimes also a little stouter, than those which have not unfrequently visited

our European countries and which come from Japan; nevertheless it must be admitted that among numerous Indian specimens I have found individuals with beaks neither longer nor thicker than those of the Japanese specimens. I have therefore reunited them, contrary to the judgment of Mr. Gould, who considers them distinct, and who is even inclined to make a third species of the Australian specimens. * * * * This bird accidentally visits western Europe; we may cite five or six instances, one in England [increased above to nine or ten], two at Hamburg, one on the Rhine, another in Germany (the exact locality not being mentioned), and as long ago as 1783 a specimen was killed at Metz; besides these we hear vaguely of other captures. It is abundant in Japan, and perhaps also in some parts of Asia, whence it has probably visited Europe. I have been quite unable to discover any difference between the colour of the plumage in the Hamburg specimens and those from Japan. I only perceive a very slight difference in the form and size of the beak between these last and those from Java; again, comparing these with those from the Australian colonies, the latter are the larger, although I find no difference in the plumage." Temminck adds that its food consists of insects and worms, and that in Java it frequents hills six or seven thousand feet in height and equally high hills in Japan. (See 'Manuel d'Ornithologie,' vol. iv. pp. 602—604.)

Turning to a recently published part (iv.) of Yarrell's 'British Birds,' I find the following additional particulars of its geographical range. It has been killed about twenty times in Continental Europe; at Dion le Monte, in October, 1842; at Namur, and at Jemappes and Louvaine, in October, 1855; in the woods at Rezonville, in September, 1788; this specimen was described by Holandre, under the name of *Turdus aureus*, in 1825; near Marseilles, in October, 1840; in the Tyrol, in 1861; at Aspang, in Austria, in 1847; in Heligoland, in September, 1834; near Hamburg; at Elbing, in Prussia, in 1849; and at Jemtland, one of the Swedish provinces, in 1837.

It has occurred at Krasnojark, on the Jenisei, also on the shores of Lake Baikal; and Herr Radde, the Siberian traveller, shot three specimens on the Tarei moor; these were two males and a female, and were apparently making their way northwards in the spring of the year.—*Newton's 'Yarrell,'* i. 254.

From these various records it seems that October has been the

principal month for noting its occurrences on the Continent, while in England it has chosen rather to exhibit itself during the shorter days at the very beginning of the year. It has been flushed from among dead leaves on the ground, and in the vicinity of marshes or water; perhaps from this circumstance, and also from a certain peculiarity in its flight, it has been taken for a woodcock. Mr. Tomes has observed that the form of the wing and the development of the breast-bone indicate great powers of flight and essentially migratory habits; in this respect, singularly associated with its terrestrial habits, it also resembles the woodcock.

Its nest and eggs are entirely unknown, and, with the exception of the few vague suggestions which I have cited, its migrations are also yet to be discovered.

In conclusion, I need only say that I shall at all times feel grateful for any additions or emendations to these observations, which I am well aware are too hastily collected to be very complete.

EDWARD NEWMAN.

Communications and Extracts concerning the Marsh Sandpiper (*Totanus stagnatilis* of *Bechstein*). By Mr. ROBERTS, Mr. EDSON and EDWARD NEWMAN.

I HAVE received the communication printed below from Mr. Roberts, the well-known naturalist, of Lofthouse, Wakefield, who has so often contributed to the pages of the 'Zoologist.' The species is hitherto, as I suppose, unrecorded as British, but is not very unlikely to occur here, being familiarly known on the Continent of Europe.

Mr. Roberts encloses in his communication a note from Mr. Edson, the gentleman who obtained it, and I have added in a separate note the synonyms from Temminck.

Mr. Roberts' note is as follows:—

My dear Sir,

Lofthouse, Wakefield, 13 March, 1874.

Mr. Edson, of Malton, has sent me information of the capture of a bird called the marsh sandpiper (*Totanus stagnatilis*). I can find no mention of such a bird in your 'Dictionary' nor in Macgillivray's 'Manual.' It must be a species new to the British Isles. The bird was shot about the 8th of January. I have sent you the description that Mr. Edson has enclosed in his letter.

Could you kindly tell me if there is such a species as *T. stagnatilis*, and if it has occurred here before? I have no work on European birds. I will try to get more information if it is worth looking after. The bird is in the hands of the person who shot it.

Yours most truly,

GEORGE ROBERTS.

Mr. Edson's note enclosed to Mr. Roberts is as follows:—

“THE MARSH SANDPIPER (*Totanus stagnatilis*).

“This species, which is closely allied to the green sandpiper, the redshank, &c., is a native of Northern Europe, where it frequents the borders of rivers, lakes and marshes, whence in the autumn it migrates southwards, pursuing its course through the eastern provinces to the Mediterranean, but does not frequent the maritime coasts of the ocean. It is abundant in Asia, and specimens killed in winter plumage have been received, according to Temminck, from the isles of Timor, Sunda and New Guinea. The beak is long, weak and awl-shaped, and its legs are elongated and slender. In summer its upper plumage is brown, with irregular black dashes; the under parts white, with brown specks on the throat and breast; tail striped diagonally with brown bands. In winter the upper surface is of a nearly uniform ashy gray, the under parts white; legs olive-green. Length about nine inches.”

SYNONYMS.

“*Totanus stagnatilis*, *Bechst. Naturg. Deut.* vol. iv. p. 261—*Scolopax totanus*, *Linn. Syst. Nat.* Edit. 12, p. 245, sp. 12. Mais point le *S. totanus* de Gmel.; et surtout celui de Lath., qui sont les jeunes de mon Chevalier arlequin.—Le petit Chevalier aux pieds verts, *Cuv. Règ. Anim.* vol. i. p. 493—La Barge grise, *Buff. Ois.* seulement sa pl. enl. 876—Teich wasserläufer, *Meyer, Tasschenb.* vol. ii. p. 376. *Bechst. Tasschenb.* vol. ii. p. 392, t. n. 11. *Naum. Vög.* t. 18, fig. 24, représentation très exacte.”—*Temminck, Manuel d'Ornithologie*, vol. ii. p. 648.

ADDITIONAL SYNONYMS.

“Ajoutez aux synonymes. *Atlas du Manuel*, pl. lithog.—*Roux, Orn. Provenç.* vol. ii. tab. 295, le mâle en plumage des noces—Der Deutsche teichurferläufer, *Brehm, Vög. Deuts.* p. 644—*Naum. Naturg. Deuts. Neue Ausg.* tab. 202, dans les trois livrées

différentes—Piro-piro jambe lunghe, *Savi, Orn. Tosc.* vol. ii. p. 278 —*Gould, Birds of Europe*, part 10, plumage d'été."—*Temminck, Manuel d'Ornithologie*, vol. iv. p. 414.

Temminck informs us that the species inhabits the north of Europe, and frequents the banks of rivers; in emigration it passes southwards through the eastern countries of Europe until it reaches the Mediterranean: never along the shores of the ocean. It nests within the Arctic Circle, but its eggs are unknown.

It will be well to observe that Mr. Roberts makes no mention of having seen the specimen, and of course I have not, neither have I any means of verifying Mr. Edson's determination of the species, but I think it well to make the announcement, and therefore have given all the information in my power.

EDWARD NEWMAN.

A Word about Museums. By C. B. CAREY.

THE word "museum" has a very dull sound. It gives one the idea of a smoke-dried looking building, in which one gets very dusty, very hungry, and very cross; where the curator looks as if he came out of a sarcophagus, and where there is a dusty, musty smell, reminding one strongly of the fulmar petrel. A museum is a place in which not only dead animals are preserved, but dead energies. Those who first started the idea of having a museum in any place, took an interest in it, arranged it, saw it grow larger, had it kept in good order. Then, when they are gone, the museum is left as a mark of what they have spent their energy in, and it remains the same day after day and year after year, till the birds are covered with dust, the eggs faded, the butterflies—each hanging on a solitary crooked pin—flutter in a grimy case, and the shells look fossilized with age. It is hard to say which is more strange—that any one should care to set on foot a museum, knowing how it will fall into decay, through the want of care of after generations, or that, having a museum in a good state of preservation, it should be left neglected.

The museum here has slept in debt for some years, but last summer it awoke and opened its doors to those who cared to enter; but it had become slightly more dusty and disordered than was pleasant. It was sad to see the good birds in so helpless a state

of confusion, for there are some very good specimens in the collection.

With a view of seeing how other places managed their ornithological department, I visited every museum I came across last summer, and as it may be interesting to some to know the state that a few of the English museums are in, I give the result of my inquiries.

At the Hartley Institution, at Southampton, I hoped to obtain some valuable hints, but I was disappointed; for the birds had been arranged some time ago, and seemed to follow Cuvier's arrangement as much as any. The foreign birds were in the same case as those of the British Isles,—I use this phrase in its fullest extent,—and they were all mixed up together. The birds are on stands in a case against the wall; but it was rather difficult to find any particular bird one wanted, as the next of kin were divided by foreign birds, which were evidently thought to be nearer allied. I also noticed one or two birds wrongly named; but they seemed taken care of and in good preservation. What struck me most was the way the tickets were put on, a neat contrivance of wire holding each ticket just in front of the bird, but not hiding it. Here, as in most museums, I found how the ornithological department had better *not* be arranged.

At Ryde there are a goodly quantity of birds, but without any arrangement: they are in separate cases, which are piled up one on top of the other: it was impossible to see them without walking on the chairs. The person in charge amused me: he was very much disgusted at my knowing an albatross without looking at the name, and exclaimed, contemptuously, "Then you got it out o' books!" But he was greatly relieved when he found that I had never seen them flying—for he had. If the Ryde Museum was put to rights it would exhibit a very fair ornithological department; but here, as in many cases, the motto is, "Take care of the fossils and the 'fowls' will take care of themselves."

At Chichester the birds are on stands in cases against the wall: they are well arranged and named, though rather dusty now. Here I offended the curator by asking if the cases had been dusted lately. They had not: that was all that was wanting. The foreign birds were in different rooms. The cases were rather too high, as it was not easy to see the upper shelf without a chair to

stand on. The light was very good here,—a side light,—so that it was possible to see the birds instead of one's own face, which is all one sees when the light comes from the window opposite, and one can see *that* at home without looking for it in a museum. Of course the light from the top is better still, but this is not always obtainable, and next to that ranks the side-light.

At Exeter I was rather unfortunate, for on entering the first room there was a nasty smell, and on looking round I found a large box full of birds, thrown in higgledy piggledy: they were in hospital; moths their disease, benzine their cure. In the next room, however, the birds were in their cases. They were in separate cases, but this is going to be altered, and they will be on stands in large cases against the wall, this being found most convenient. I was much struck with the size of the tickets: one goldfinch, which had a little case with a little pane of glass, had a ticket at least one-third the size of its glass; indeed all the top row of birds were quite covered by their names; but this will all be altered now. Some specimens of owls and falcons here are splendidly stuffed: the life seems arrested in them, not taken from them. It is hard to believe that they will stay there, and not fly away when one is not looking. It is an art, stuffing like this; too often the very shape of the bird is destroyed, as it stands uncomfortably looking at nothing; but here the very positions are natural. One bird seems to see an enemy approaching, for it has raised its head from tearing in pieces its poor luckless prey, and is giving a hasty glance round to see if it has time to get another bite before it is obliged to fly away. I must not omit to mention "Night and Morning," two owls, one with its large eyes wide open, looking the very picture of wisdom, the other winking and blinking, looking the picture of misery.

At Taunton the re-arrangement has been effected with all the recent improvements. Here one sees how things ought to be done. The foreign birds are in a case by themselves. The birds are on stands in cases against the wall. The locally shot are well distinguished from the general British birds by the different colour of the tickets, on which their names are beautifully printed, or rather written, for it was all done by hand. This distinction is a great advantage, for one can tell in a moment, by the colour of the ticket, whether a bird is locally shot or not. It was quite a pleasure to look at the clean, well-arranged birds in their new case, after

having seen others which seemed sleeping in dust, unlooked after, unlooked at.

C. B. CAREY.

Candie, Guernsey, April 18, 1874.

[I have somewhat to say about museums, the appointment of curators, &c., but must defer it to the August number.—*E. Newman.*]

Ornithological Notes from North Lincolnshire.

By JOHN CORDEAUX, Esq.

(Continued from S. S. 4031.)

MAY, 1874.

The extreme cold which continued all through the month of May has had the effect of considerably retarding the arrival of our smaller summer visitants. At the same time all this unseasonable weather—frost, sharp north-easterly winds, accompanied by heavy sea-fogs—has probably induced the numerous flocks of waders on their passage northward to prolong their stay on the muddy foreshores of the river as well as along the sea-coast; thus it has been, without exception, the most favorable month for observation I ever recollect; never have the shore-birds visited us in greater number, or tarried so late in the season. We have not, however, had the weather to thank altogether for this ornithological treat; the new Bird Act has had much to do with it: the birds have been unmolested by the prowling gunners. I could this season go down any day with my telescope to the foreshore with a certainty of finding the coast undisturbed, the birds feeding quietly on these oozy flats. In former years it certainly would have been a rare occurrence in this parish to have met less than three or four hulking fellows with guns lounging along the embankment, blazing away at everything which flew past under eighty or one hundred yards, from a curlew to a stint; whilst others, more practical, would be stationed in holes dug on the “muds,” and armed with heavy double guns, dealing death and destruction to every passing flock, the effect being to drive the birds away altogether, or make them so wild that it always required the utmost care and precaution to obtain even a sight through a telescope; but all this is now altered, and deeply thankful are we who dwell on the sea-coast for the change—

a change which has made a ramble along the sea-shore at this season a pleasure, instead of a source of vexation and annoyance.

ARRIVAL OF SUMMER MIGRANTS IN MAY.

House Martin.—May 4. Wind N., sharp frost, and ice on the ponds and drains. Since the introduction of weather-boards on the gable ends of our cottages, affording admirable positions for nests, the martins have increased in this village.

Whinchat.—May 5. Wind N.W., with showers of sleet.

Sedge Warbler.—May 9. Wind N. Seen and heard.

Garden Warbler.—May 17 (wind N., with 4° of frost on nights of 16th and 17th). Seen and heard.

Swift.—May 18. Wind N.N.E. First appearance; four seen.

The spotted flycatchers (May 31st) have not yet arrived in the garden.

NOTES THROUGH A TELESCOPE.

Dotterel (*Eudromias morinellus*, Linn.).—There were five dotterels from the 14th to the 21st in one of the large pasture-fields near the Humber. I found these near the same spot each day, and with a binocular have several times watched them at very close quarters. They appear to feed mainly on small grubs and wire-worms extracted from amongst the grass-roots. These are the only dotterel I have seen this season.

Gray Plover.—May 21. Observed many hundreds this morning scattered in various sized groups along the muddy foreshores of the river. Amongst them were many fine old birds in full summer plumage, others in endless stages of transition, and many still in gray winter dress. None seen after this date.

Knot.—May 20. A few on the flats on this and the following day; I can, however, only find two with the red breast, others are slightly washed with rufous on the under parts. The greater portion still remain clothed in sober winter gray.

Whimbrel.—May 22. Up to this date very numerous, both on the foreshores and in the marshes. On the 23rd they had entirely left the district. I recently saw a pair of small and very light-coloured whimbrel, much resembling examples of *Numenius tenuirostris*, if they did not actually belong to this species.

Bartailed Godwit.—May 18. Arrived on our flats, in their vernal migration, in very considerable numbers about this date. On the

25th, opposite my marsh farmstead, I found two flights feeding on the muds in the wash of the advancing tide. In the first were twenty-six, in the second twenty-five birds. The first flock had two, a pair (one of which was considerably larger than the other), in very perfect summer plumage; three others showed a very considerable advance, but still had the rufous of the under parts much broken into with white; the remainder were, without exception, in the gray winter garb, and, as far as I could see, without the slightest tendency to change it. Number two flock had a pair in full summer plumage; the smaller of these, the male, was the darkest and most richly-coloured godwit I have ever met with; it might almost have passed for a melanite variety, and in some shades was perfectly black, the under parts being as richly coloured as is that almost black patch in the centre of the chestnut abdominal belt in the dotterel. It was very interesting to watch these godwits foraging for food; they were following the receding wave, some rapidly picking up small objects left on the mud, others boring most assiduously in the broken water, often with their heads completely buried, and wading breast deep; one I saw carried off its legs and swimming beyond the breakers.

Ringed Plover (*Ægialitis intermedius*, *Menetries?*).—May 25. There was a large mixed flock of ringed plovers and dunlins on the muds this morning, and of the former, about a score, carefully examined, at very short range, with the telescope, belonged to that smaller race or variety which is said to visit our shores in May. These little birds are altogether considerably less than the familiar ringed plover of these coasts, which nests at Spurn, and examples of which I had opportunities of comparing with them later in the day. Their colours also are brighter and clearer, and the black rings and markings even more distinctly defined than in the common race; the legs seem paler, almost semi-transparent, as if carved out of amber. Beautiful chastely-coloured little birds they are; at the first glance I thought I had pitched upon a troop of the rare little ringed plover. This small race, which visits our shores in the spring, I take to be the southern form of the ringed dotterel. Is then this southern form the *Ægialitis intermedius* of Menetries? In the only skin (given me by Mr. Stevenson) of the smaller race which I possess, the orange colour at the base of the bill is not proportionately narrower than in the common ringed dotterel. I should say that in the examples I saw to-day on these flats the

broad black tip covered half the bill. Of course it is difficult to decide these nice points of distinction even with the aid of a powerful telescope; but this is now for a season the only means available to the out-door naturalist.

Dunlin.—May 5. Still rather numerous on the coast; all, without exception, examined to-day are in summer plumage. Amongst these were several of the smaller race or variety. The difference in size is almost more marked than between the two ringed dotterels. In two dunlins feeding side by side the one seemed nearly double the size of the other. The smaller bird has the upper plumage more richly coloured,—more rufous in it,—and the abdominal black patch covers proportionately less space, or is more encroached upon by white. I should say this smaller race is quite as good a species as is *Ægialitis intermedius*. It differs altogether from its congener in size, is shorter and straighter in the bill, has shorter tarsi, and richer and more variable plumage.

Turnstone.—May 25. This summit of our sea-rampart, with its dense fringe of waving grass, makes a capital post of observation. You have only to stretch yourself on the embankment, push the telescope through the grass, open your note-book, and commence observations on the first group of birds within range. I have spent many happy hours in this way; likewise on dreary sea-coasts, behind the ridge of drifted sea-weed and tide-wreck, held long vigils, marking the ways and habits of shore-birds,—eager, too, for specimens, or why that double tube projecting ready from its miniature embrasure between those bottomless, wave-cast fish-hampers. To-day all is peace, and no deadly weapon within ready grasp, or how could I resist the temptation?—for here, just below, on the slope of the embankment, in the bright sunlight, are three pairs of turnstones in their lovely summer dress—such perfect specimens I have never seen before. No need of a glass now, for they are near enough to note unaided even the colour of the legs and irides, and every shade and marking of that richly variegated plumage of chestnut, black and white. I can mark them, too, picking out little crabs and other small crustaceans as they toss to and fro, in their eager search, the black fronds of the bladder-wrack. Till I choose to make my presence known, they are totally unconscious of being the objects of so close a scrutiny. As I lift my head, with a querulous alarm-whistle, they are on the wing, displaying to perfection their richly variegated dress; but their flight is short, as

they speedily alight within a hundred yards on the oozy flat amongst the ringed plovers and dunlins.

Redshank.—May 25. There were several redshanks on the flats to-day in perfectly mature breeding dress. There was one, however, still in the dusky grayish brown plumage of immaturity; in fact, exactly in that plumage in which we find birds of the year in the autumn.

Little Bittern.—I recently examined a bird of this species shot in the parish of Easington, in Holderness, not far from the Spurn promontory. It was shot about the 25th of May, and, for obvious reasons, the name of the person by whom it was killed did not transpire. One side is very much injured—in fact, nearly shot away. The sex was undetermined; I should say, however, it is undoubtedly a mature male, and in very perfect plumage.

JOHN CORDEAUX.

Great Cotes, Ulceby, Lincolnshire.

May 31, 1874.

Ornithologal Notes. By H. DURNFORD, Esq.

Common Buzzard.—January 3, 1874. The stomach of one I examined to-day contained fur of mice. April 12.—One seen to-day on the sandhills on the Lancashire side of the estuary of the Mersey, near Southport.

Wheatear.—April 5. Observed several pairs on rocky ground near Barmouth, Merionethshire. April 10.—Pretty numerous on the sandhills about Formby, but not yet arrived in full force.

Green Woodpecker.—January 3. The stomach of one I examined to-day was crammed with the remains of ants.

House Martin.—April 3. Observed a solitary bird skimming over Bala lake to-day. From the numerous notices in the 'Field,' these birds and swallows have evidently arrived about a fortnight earlier this year than usual. Shortly before seeing this martin I had observed two wild geese settle in the middle of the lake. It is not often one can see our summer and winter visitors on the same day.

Stock Dove.—March 13. Pretty numerous on the sandhills on the Flintshire coast; I observed one fly from a rabbit-hole, and on a nearer examination I found it had commenced its nest. April 29.—Found one egg in a rabbit-hole in the sandhills near Southport.

Ringed Plover.—Observed a few pairs on the Flintshire coast on the 13th of March in the neighbourhood of their breeding-grounds. April 29.—Several pairs have now betaken themselves to their nesting-grounds in the sandhills near Southport, and fly noisily round any intruder; I think they have not, however, yet laid.

Dotterel.—A small flock was seen about the 22nd of April near Formby, making their way north-east, and one was heard a few days afterwards in the same neighbourhood; they occur here annually about this time, but sparingly.

Purple Sandpiper.—January 2. Two in St. John's Market, Liverpool, to-day, which the salesman assured me had come amongst other wild-fowl from Southport.

Dunlin.—January 10. Watched for some time, through a powerful telescope, several dunlins feeding, and observed they frequently plunged their beaks into the soft ooze quite up to the base. April 29.—Many still on our flats in small flocks, but nothing like the vast clouds one sees in winter.

Redshank.—January 10. I was much interested in watching the actions of a single bird feeding on the bank of the Alt; it never stood still for a second, but was ever on the move, running about hither and thither, and continually probing the soft ooze: these birds are very active whilst feeding, and walk with an extremely graceful gait, but seldom run.

Water Rail.—January 12. The stomachs of two I examined to-day contained a little fibrous vegetable matter, remains of small mollusks, and legs of a water-beetle, with a few pieces of gravel and chalk. My brother took three small univalve mollusks from the gizzard of one on the 4th of February. January 20.—My brother tells me he hears water rails crying almost every morning and evening in the reeds and sedge bordering the Test, Longparish, Hampshire.

Wild Duck.—January 17. Went into Flintshire to-day, and was fortunate enough to meet with a large flock of ducks and teal on the coast. On a marsh near Mostyn the neighbouring villagers trap a great many in a curious and novel way. They place large rabbit-traps about dusk under the water in the shallow tidal gulleys and pools, which are the favourite resorts of the ducks. During very cold weather, when the lakes in the mountains are frozen and the mountains themselves covered with snow, large flocks repair to

the tidal marshes on the coast during the night, and a clever trapper will then often secure five or six couples.

Sheldrake.—March 13. Observed several pairs on the Flintshire coast to-day: they repair to the sandhills about this time.

Little Grebe.—January 19. My brother, whilst out after ducks this morning, observed a little grebe floating on its back in the water, which, on a nearer examination, proved to have been choked by a "miller's-thumb," which the bird had endeavoured to swallow head first, and had become firmly fixed in its jaws. The fish was full of spawn.

Gulls.—March 13. Hundreds of herring gulls on the sandy flats on the Flintshire coast, mostly fine adult birds, which breed numerous on the rocks some thirty miles west of Mostyn; also observed many common gulls, and blackheaded with full black hoods.

H. DURNFORD.

Waterloo, Liverpool, May 4, 1874.

Ornithological Notes from Torquay. By Baron A. VON HÜGEL.

(Concluded from Zool. S. S. 3909.)

Blackheaded Gulls.—Noticed several specimens of *Larus ridibundus* on the 15th of February which had assumed the full spring plumage. They were flying in a large flock of other gulls off the mouth of the Torquay Harbour, their dark heads making them very conspicuous, even at a considerable distance.

Common Buzzard.—A specimen killed at Haccomb, near Newton, on the 23rd of February. This is the second bird of this species shot in that locality this year (Zool. S. S. 3907).

Crested Tit.—Noticed one of these birds in Chelston Lane on the 26th of March, which allowed of such a close approach that I nearly succeeded in touching it with my walking-stick. *Parus cristatus* has, I believe, never before been recorded from Devonshire, and only few instances of its occurrence in any part of England have been noticed.

Swallow.—The swallows made their first appearance on the 13th of April, on which day I noticed a pair; but they were seen in numbers only a week later.

Sand Martin.—The first sand martins I observed on the 20th of

April at Hay Tor, on Dartmoor; but as yet, up to the 3rd of May, no common martins have been observed.

Ravens and Peregrines.—Whilst spending the day at Hay Tor, I noticed a pair of ravens uneasily flying about the Tor, and sometimes swooping down close past me. Their actions evidently betrayed the presence of a nest, and a few days ago I heard that some nestling ravens were offered for sale which had been taken on the moor. On the same day (April 20th) I likewise observed two large hawks, which were soon joined by a third, circling about at a great height overhead. I could not make out the species, but think they must have been peregrines, as their wings seemed long long and pointed, and not rounded, as in the buzzard.

Cuckoo.—First heard about Cockington, near Torquay, on the 24th of April.

Warblers.—I have noticed or heard all the annual visitants, with the exception of the wood warbler. The blackcap, which seems very plentiful this spring, was heard for the first time on the 14th of April.

Gannets, &c.—The gannets have not yet left our coast, as I noticed a good many at the mouth of the bay off Hope's Nose, on the 27th of April. There were also a number of the great black-backed and herring gulls about; and the razorbills, all in pairs, were quite plentiful, decidedly more so than the guillemots, which is curious, as the latter bird is by far the most numerous during the winter season. Many individuals of both species showed yet signs of the winter plumage.

A. VON HÜGEL.

Chelston Cross, Torquay,
May 4, 1874.

Notes from Castle Eden. By Mr. JOHN SCLATER.

ON the 9th May, at 8 P.M., I heard the screaming of a bird close to my window, and on looking out I saw two rats (full grown ones) with a thrush lying between them: they had killed it in a moment. The poor thing only lifted a wing once: it was bitten on the side under the wing; the rats made no attempt to eat it or carry it away, but ran playfully off. It was an old thrush, and had a nest of four young close by. I had for some time been at a loss to account for the unusual noise or alarum of the birds, especially in the evening, and had looked in vain for cats or hawks. I never

suspected the rats: they have always been numerous in this place,—an artificial mound, about fifty yards long by fifteen wide, running between the house and the Dene, covered with “rock-work,” low-growing bushes, and crowned with laurel and holly; from this little place I have no end of amusement; it is always moving with animal life. In the nesting season I have found the blackbird, song thrush, missel thrush, garden warbler, blackcap, whitethroat, hedge sparrow, robin, longtailed tit, bullfinch, greenfinch, chaffinch, wood pigeon; and this year the sparrow has thought fit to place a bundle of straw and feathers on the top of a rather bare holly; and a short time since I let a pair of tawny owls from confinement, fully expecting they would go off into the Dene, but they took up their abode in this coveted place, and here they might have assisted me in keeping down the rats by killing the young ones (I have a doubt whether they would tackle a full-grown one), but they were mobbed from morning till night, the missel thrush being, as usual, the boldest in attacking them, the blackbird the noisiest; and this noise was so incessant and annoying that I was obliged to shut the owls up again. Twenty-six pheasants made this place their winter quarters, all of which I have seen roosting on one tree,—an old Scotch fir; the greater portion of them had been hand-reared at a short distance off. I fed them regularly twice a day with maize; some of them became so bold as to fly upon the window-sill; the creaking of the window on being opened, or a whistle, would always collect them; the rats, tits, finches, and even the wary wood pigeons, would put in an appearance, at the same time taking care to be furthest away from me; they would allow me to throw out corn when within fifteen yards without flying away; but if the pheasants were not between them and me, they would be off if I showed my face at the closed window. The pheasants have gradually disappeared since the breeding season commenced. An old cock that has never left the place for six or seven years considers the place should belong to him and his six wives; at present, he is in turn compelled to give way at the approach of a game bantam and his five wives: this little fellow is master of them all. I have, however, an occasional visit from some other cock pheasants, when they can steal past the old one. Two lame cocks he never quarrels with, but torments them until they fly away, by displaying himself to them, exactly in the same manner as he does to the hens, so that love-making is not

(as some writers would make us believe) the only incitement to this exhibition of the plumage, or it follows that this old cock is making love to the young ones. I may add, here, that I often see this display of plumage even in winter amongst a group of cock birds, when no females are near them: if another cock thinks himself as good looking as the one displaying himself, he displays in turn, and they always face opposite directions; their heads and necks are immediately brought erect, the feathers fall close to the body, except the tail, which remains spread, and the upper parts still shown to each other; it then assumes an attitude of defence and defiance, and either ends in a fight, or more frequently one of them hops to one side, and immediately raises the feathers of the head and neck, which seems to indicate fear or submission; the other either resumes his display as at first, or finishes off by shaking himself and crowing. I have frequently seen hen pheasants draw up to each other, sometimes three or four at once, spreading their tails and showing their upper parts by drooping the sides next to each other, in a similar manner, and they invariably use a little threatening language to each other while they are braced up. The male pheasant will sometimes display himself to the female in another manner: he will run up to her from some distance, with his wings trailing and his feathers puffed out, and on coming up to her circle round her with the outer wing spread, just like the domestic cock.

When I commenced to write to you I had no intention of saying one word on this subject, and yet I am prompted to make use of the parsons' hackneyed phrase of—"one word more." The domestic cock is said to lower the *wing* next the hen; this is, perhaps, more apparent than real; the spreading of the wing is always on the side furthest from the hen, that side of the body being raised to allow the wing to be spread downwards in the shape of a shell; it is their habit also to raise the foot and draw it across the wing when spread, which produces a slight rustling of the feathers; this, then, necessitates the lowering of the whole of the other side of the body: let anyone raise his elbow, and then try to scratch it with his foot without sinking the other elbow. Now, without admitting that these displays are "purposeless," after what I have seen, I will say that they are *not* used only as "a charm for the female, and no other purpose," because different emotions seem to produce the same display.

Well, I have not yet accounted for all the inhabitants of this little place: the hares and rabbits make their way into it, although it is wire-fenced two feet high; the hares get over it, and the rabbits have hitherto made their way through under it. To prevent this the wire has been buried eight inches, which, but for the rats, would be rabbit-proof; but these pests, although they scale the fence with the greatest ease, are determined to have a way beneath. I saw four of them at work making one hole; I watched them for five minutes before shooting them. There are, perhaps, no other animals that quarrel more amongst themselves than rats do, and none are more united for purposes of destruction. Then occasionally a weasel, and less frequently a stoat, will appear on the scene. I have seen the *young* rats bouncing through the fence in front of them, but I never saw them kill any rats, and I am not going to suppose it. However, weasels and stoats are easily got rid of, but not so the rats; I am completely beaten by them. Last year, about this time, I had reduced their numbers, as I expected, to ten, as I could never see more when feeding them for a night or two in the open. I then shot six by a double discharge, but the next night I counted fifteen. This was a poser for me; as fast as I shoot them others from the Dene take their place, and I really think I have shot myself into a worse lot. I found two more thrushes killed yesterday, and saw one this morning with a broken wing. I am totally at a loss what to do with them; an "asphyxiator" could not well be used in such a place, certainly not at present, without doing as much harm as the rats. I had almost forgotten to mention that my old friends the kestrels are hovering over the scene daily: this is also rather provoking, but I will not shoot them.

On the 17th May I was awake at 5.30 A.M. by the screaming of a bird. I jumped up, and looking out saw on a large beech tree near the window a cock pheasant sitting on a rather weak branch, sometimes using his wings to balance himself, and a male blackbird vigorously attacking him, by swooping down at his head from front and rear alternately, never crosswise. The pheasant made no attempt to defend himself, but kept ducking his head to elude the blow: this was kept up for eight or ten minutes, when the pheasant flew down and the blackbird left off, and settled on the very place the pheasant had sat, dropping his wing, and seemingly quite

exhausted. What the pheasant had done to deserve such chastisement I cannot conceive: there is no nest on the tree, but one amongst the shrubs, which could be seen from where the pheasant was. A lot of other birds assembled on the tree to witness the performance: the starlings, looking down from the top branches, seemed particularly interested in it, and by their curious gestures one could almost imagine them making some remarks upon it.

A gentleman told me he saw (a short time since) a pair of missel thrushes attacking a squirrel: he did not observe any nest on the tree where it took place. This at once brought on the charge against them, as mentioned by Mr. Wood, of their eating young birds, eggs, &c.; but from my own observations I am sure that it is quite immaterial whether they were visited by bird- or egg-eaters: all that approach near their nests meet with the same rebuff. Now, except Mr. Wood's, are there any well authenticated records of the squirrel eating birds, eggs, or insects: "doctors differ;" and I have heard it flatly denied that they are guilty of anything of the kind. I should be very glad to be enlightened on this subject.

May 19th. Numbers of fieldfares are still about here. They frequent the trees close to the house, as in hard winter weather; there has certainly been a long succession of north-east winds, which they are probably afraid to face. Yesterday I saw a great many in the park, mixed up with old and young blackbirds and thrushes: it had rather a puzzling and unnatural effect upon both eye and ear. What has become of the swallows? Up to the 18th I had only seen one. To-day, 21st, four more have arrived; but neither house nor sand martin have I seen yet. The swallow tribe was very limited last year with us: none nested at the house; and I never knew less than four or five pairs nest yearly previously.

A night or two since I was standing at the door about 11.30 p.m., when I was surprised to hear a hedgesparrow burst into full song: the night was very dark and cold; the pleasures of matrimony must have had something to do with it.

The gentleman who told me about the missel thrushes and squirrel said that he had watched for some time a mole taking water, and that it lapped the water just like a dog or cat.

JOHN SCLATER.

Castle Eden, May 20, 1874.

The Hairy-armed Bat (Scotophilus Leisleri) in Ireland.

By RICHARD M. BARRINGTON, Esq.

THE following communication contains the particulars of an interesting discovery in connexion with the Natural History of Ireland. The hairy-armed bat (*Scotophilus Leisleri*) has been detected in tolerable plenty near Tandragee, County Armagh. I append some remarks on the account given of this bat in the new edition of Mr. Bell's work on 'British Quadrupeds.'

On the 28th of June, 1868, when wandering through the lofty beech grove belonging to the Duke of Manchester at Tandragee, which grove is situated in what is locally termed the "lower demesne," my attention was attracted by a chirruping, clicking sound which apparently proceeded from a hole about twelve feet up the trunk of a large tree. After some trouble I managed to get up to this hole, and as I did so the noise greatly increased. Within I saw a moving brown mass, and I thought I could distinguish bats. Cautiously putting my hand in among the chirrups and clicks, I made a grasp. They were bats, without mistake, for I pulled out eight or nine, but, as they struggled so violently, all escaped but three or four. The bats in the hole were now so much alarmed that they commenced flying out into the sunshine, and continued doing so for several minutes, tumbling and scrambling over one another in a ludicrous manner, so eager were they to reach the entrance. Probably eighty or a hundred bats thus flew out; some appeared to have young ones adhering to their teats, but I will not speak positively on this point. I only captured six in all. On leaving the tree many bats still remained far up in the hollow trunk, beyond the reach of my arm. I presume they considered themselves quite safe, as they did not venture to come down.

At the time I knew little or nothing about our native Cheiroptera, and as my prisoners could not be induced to eat I let them out, never imagining they were anything uncommon; for indeed they seemed common enough among the beech trees.

In the beginning of the present year (1874), being obliged to work up the bats, for a lecture on Irish Mammalia, I very soon began to suspect that the species I saw in such numbers in 1868 was not a common one. My curiosity was aroused, and in February last I wrote to my brother-in-law, Mr. T. H. White, J.P., who

resides at Orange Hill, near Tandragee, asking him to examine the old beech trees for specimens. His search was unsuccessful, and none could be found. On the 18th of May he made a second search, and found the bats in considerable numbers in one of the hollow trees. As with me, they flew out so fast and fluttered so much that he captured very few—four, I think. Having sent one to me, I was not long in recognizing the specimen as the hairy-armed bat. Not content with one, I wrote for some more, and on May 22nd another raid was made. The old hollow beech tree from which so many had flown on the 18th was found to be quite deserted; but after a brief search squeaking was heard high up in another, perhaps thirty-five feet from the ground. A ladder was obtained, and on examination the colony was found to be in a hollow bough of the tree. The cavity had two orifices, one in the trunk, the other in the bough itself. A bag was nailed over the lower opening, and the bats were poked out from above. In this way sixteen were taken. This nest was very inconsiderable, when compared with the large one visited a few days previously. Twelve were transmitted to me, alive, by post. I understand the post-office officials were delighted to get rid of the mysterious parcel from which such strange sounds issued. The animals were none the worse for the journey, but scrambled and flew about in the liveliest manner when the box was opened. They were all of the hairy-armed species. I have presented two specimens to the British Museum and two to the Royal Dublin Society's Museum. Dr. Günther informed me that this species would readily take food, but my efforts to induce them to eat either flies or meat were unavailing.

I have made use of the word "nest" in the foregoing account of the habits of this bat; but I wish it to be understood that this word, in the way I have used it, does not imply anything more than a collection or number of bats clinging to the rotten brown wood in the hollow of the tree, or clinging to one another in a bundle or swarm. There was no structure, nor was there any arrangement of the decayed wood that I could perceive, so as to make a "nest," strictly so called.

Let us now see what is said about this bat in Mr. Bell's new edition:—"It was first discovered in Germany by Leisler, and is described by Kuhl; but I am not aware that it has ever before been figured. The present representation was taken from a figure in the British Museum, the only one known to have been found in

this country when the former edition of this work was published. Since that time it has been taken in Ireland, in a cave by the Blackstaff River, near Belfast. It was communicated to Dr. Kinahan by Mr. Patterson, and we have received from the former gentleman a full description, which leaves no doubt of the identity of the species. The same accurate observer has informed us of the capture of another specimen at Belvoir Park, County Down, several years since, and now in his possession."

The first locality given is inaccurate, at least if we are to judge by Dr. Kinahan's paper on this bat, read before the Dublin Natural History Society in 1860, and reported in their 'Proceedings.' I give an extract from the paper:—

"Habitat unknown. Localities: Belvoir Park, Co. Down; Belfast, Co. Antrim, July, 1858. Habits: according to Mr. Darragh's account, with whom the last-quoted specimen lived for ten days, it was at first shy, but afterwards became tame, and fed readily. * * * He obtained it living from a man who knocked it down with a fishing-rod in Blackstaff-lane, Belfast. * * * The species seems to be rare everywhere, as according to the authorities it is rare in museums."

Mr. Darragh, through whose instrumentality the above specimens were recorded, informs me that in 1868 a third specimen was taken in the suburbs of Belfast. However, now that we know the hairy-armed bat is tolerably plentiful, at least in one locality in the counties surrounding Belfast, it will be the less necessary in future to record the capture of solitary individuals when they occur in that part of Ireland.

Further on it is said:—"Of the hiding-place of the Leisler's bat we know nothing from our own observation; but, from its appearing more frequently near villages than elsewhere, are led to suspect that it is not, like the noctule, a tree-loving species. * * * Temminck says that this bat habitually retreats to the holes of trees in the vicinity of stagnant water, a statement the accuracy of which we are much disposed to question."

We see that Mr. Tomes' suspicion proves erroneous, and that the hairy-armed bat is a tree-loving species, like the noctule. Temminck's statement is probably accurate. Where the hairy-armed bat hibernates I do not venture to say. Mr. White could discover none in February last among the beech trees.

Before concluding, I would just point out a strange inconsistency

in Mr. Bell's work. In the specific character of this species of bat, the tragus is stated to be "barely one-third the length of the auricle," and in the more minute description given in the larger type the tragus is stated to be "half the length of the ear." Which statement are we to take as the true one? Kinahan says, "nearly half the length of the ear." I would say one-third the length would be most accurate. The colour of the fur is variously given by writers: it certainly is not "bright chestnut" at the surface, as stated by Mr. Tomes, and it can scarcely be called "duskyish red," as given by Kinahan. Chestnut-brown appears to me the most accurate description.

Mr. Newman has given us a review of Bell's 'British Quadrupeds,' and he has, I think, let the editors off easily. I fully endorse his opinion that "This edition has been issued in an incomplete and unsatisfactory, although I can by no means say hasty, manner; yet there can be no doubt that sufficient time has been taken to produce a work of exhaustive excellence." I could point out four or five misstatements, especially in connexion with Irish Natural History, of which too little is said. The description of the hairy-armed bat exhibits one inaccuracy and a contradiction. *Mus alexandrinus*, as Mr. Newman well observes, has been snubbed completely: he is not even buried in the preface. It is a pity to have this, the best work on the subject of which it professes to treat, spoiled by the want of a little care on the part of the editors.

RICHARD M. BARRINGTON.

Fassaroe, Bray, Co. Wicklow,
June 11, 1874.

PS.—Since the above was written, I have received a male specimen of the hairy-armed bat from Mr. Frederick Haughton, of Levitstown, Co. Kildare. It was shot about ten days ago near Tankardstown Bridge, the locality where Kinahan discovered Daubenton's bat. This is quite a new locality. It is not a little remarkable that the twelve specimens of the hairy-armed bat received from Tandragee were females.—*R. M. B.*; June 20.

Albino Water Rat.—We have just mounted a perfect albino water rat, which was obtained near Hurstpierpoint, Sussex, a few weeks ago.—*John Pratt*; 11, North-street Quadrant, Brighton, May 19, 1874.

A Flight of Bats.—On the 23rd of May, while walking with a friend, about 5 P.M., we noticed a flight of twenty-seven large bats steadily flying in a north-easterly direction. Is not this unusual? Neither my friend nor myself have ever before witnessed a similar occurrence.—*Arthur J. Clark-Kennedy; Little Glemham, Suffolk.*

Habitat of "Rat-Bats"?—I happened a few evenings ago to come upon a habitat of bats. Their home is a deserted woodpecker's hole, from which such a twittering and squeaking proceeded that it induced me to stay and watch their departure. Just as dusk was setting in the noise ceased, and out flew, as quickly as I could count, no less than sixty-three large bats, commonly called the "rat-bat," I believe. A few evenings afterwards I counted sixty-nine from the same hole—all the large-sized bat, and evidently one species only.—*George W. P. Moor; Great Bealings, Woodbridge.*

Complaint in Nestling Birds.—A pair of greenfinches built their nest in the garden this year, and soon after the eggs had been hatched a small white bladder appeared on the neck of one of the young birds. This bladder increased, and in three days the bird was dead. The remaining young ones also died, being affected with similar bladders about the same place, low down on the right side of the neck, just where it joins the body. Can any of your readers kindly inform me what this disease was, and what engendered it? I believe there is a complaint among birds; akin to this, called "tympany."—*Arthur J. Clark-Kennedy.*

Variation in the Song of the Blackcap Warbler.—I have given pretty much attention to the songs and notes of our birds, and summer visitors particularly, and have never been more deceived than in the last two mornings by an entire difference in the song of a blackcap from any I have ever listened to. My sight not being very keen, I asked Mr. Vingoe, who has given a great deal of attention to our songsters, to accompany me this morning, which he did, and had a full opportunity of listening to the monotonous passages uttered, and which entirely took him by surprise, until he got a full view of the blackcap in a low tree, with the black head quite clear. The song of the bird was uttered with two or three introductory sweet notes, and went at once, and sometimes without any introduction, to the leading theme of the song, resembling the words, "tiow wee," "tiow wee," "tiow wee," uttered distinctly, and sometimes repeated four times, but generally three; each passage was the same, with scarcely any variation, and very short; the quality of the notes full and sweet, like the usual song-note of this bird, but the melody and performance of the song totally different from and without any of the delicate expression of the blackcap's usual song. At a little distance off, where the quality of the notes was lost, the expression of the passage put one in mind of a titmouse "see-sawing." This may be

interesting to those of your readers who have given attention to the songs of our warblers; but I am quite sure that any one at all acquainted with the songs of birds would have been deceived as to the author of this music, unless he saw the bird.—*Edward Hearle Rodd; Penzance, May 27, 1874.*

Curious Nesting-place of the Greater Tit.—This morning when the gardeners here were removing a large vase, preparatory to placing a flower-pot in it, they found a nest of the greater tit containing five or six young birds about half-fledged. At the bottom of the vase is a narrow neck leading to an open square base in which the nest was placed. The only possible entrance to this place was down the narrow neck. I only regret that I was too late to prevent the men disturbing the nest, as I should have been curious to see whether the young birds would have eventually found their own way out, or whether the old ones would have continued to feed them, even when fully fledged.—*T. E. Tatton; Wythurshame Hall, Cheshire, June 13, 1874.*

Curiously situated Nests of Tits.—A correspondent in the June number of the 'Zoologist' records an instance of a pair of blue tits (*Parus caruleus*) building in a hole in a gravel-pit. In June, 1865, I found a nest of the greater tit (*P. major*) in a similar spot, with seven eggs. Two years prior a pair of blue tits built in a letter box attached to a door in this parish, when four eggs were laid before they deserted. This was noticed in the 'Zoologist,' I believe, at the time, but I cannot refer to the number. In May, 1866, my brother found a nuthatch's nest in a sand martin's hole, the entrance being obstructed by mud in the usual way, from which he took six eggs.—*George W. P. Moor.*

Tree Sparrow building in Cambridgeshire.—In the 'Zoologist' for May, Mr. Doubleday mentions Aldwinkle, in Northamptonshire, as a locality in which the tree sparrow builds. It may not be generally known that these birds build in large numbers along the sides of the Cam, where I have seen many eggs taken from the holes in the old pollard willow trees: the eggs are considerably smaller than those of the common sparrow. In Meyer's 'British Birds,' I see, both Aldwinkle and Cambridge are given as localities.—*Id.*

Nesting of the Tree Sparrow.—Mr. Doubleday, remarking on my note (Zool. S. S. 3947), that "nests of the tree sparrow were, I believe, observed in some tall trees by the roadside," says, "These nests were probably those of the house sparrow, which frequently builds its nest in the branches of trees; but this is never the case with the tree sparrow, which invariably builds in holes in old trees, as pointed out by the late Colonel Montagu." That the house sparrow frequently builds in trees I am well aware, having found their nests so placed more than half a century ago, and in my Tunbridge notes (Zool. 5683 and 5752) I described, at some length, their manner of building, &c. One reason for believing, or thinking, that the nests seen

in Brittany were not those of the house sparrow, was their being so far from town or village. I know what Montagu says, and doubtless Mr. Doubleday is equally well informed as to what Yarrell has written upon the subject. The house sparrow generally builds in holes, and I have found their nests placed between stems of ivy and the trunk of the tree. Personally, I have had no opportunity of studying the habits of the tree sparrow, and what I have been able to gather from various authors has not enlightened me much. Even Montagu evidently knew little or nothing of the habits of the species in 1802; he merely says, "it always makes its nest in trees, and lays five eggs;" and it was not till some ten years later that he found "two nests of the tree sparrow with four eggs in each, in a decayed and pervious pollard." He then, somewhat hastily I think, jumps to the conclusion that it "never makes its nest amongst the branches of trees or in buildings."—*Henry Hadfield; High Cliff, Ventnor, Isle of Wight, May 21, 1874.*

Starlings laying in the Hole of a Sand Martin.—Whilst searching for eggs of the sand martin yesterday, in a pit at Herne, near Herne Bay, I found one hole which had evidently been enlarged and lengthened, and putting in my arm quite up to the shoulder, I found three eggs of the common starling; they were lying on the bare sand, without the slightest attempt at a nest. The eggs are slightly more elongated than any that I have previously taken. When I first entered the sand-pit I saw a large bird fly out of one of the holes; but it never occurred to me, until I found the eggs, that it could be a starling: I supposed it to be a blackbird, and almost expected to find one of the holes half choked up with a huge nest.—*A. G. Butler; Sittingbourne, Kent, May 20, 1874.*

Greater Spotted Woodpecker and Starlings.—The subjoined note has been sent to me by a very reliable observer, residing at Keswick, near Norwich, who writes, under date of the 23rd of May, to the following effect:—"Early one morning in the beginning of this month I heard a great deal of noise and chattering of birds on the top of an ash tree close by my house, which I found to proceed from a pair of starlings and a male greater spotted woodpecker fighting for the possession of a hole in the tree, apparently for the purpose of nesting. First one would go in and then the other, constantly driving each other away. This lasted for at least half an hour, at the expiration of which the woodpecker left the starlings in quiet possession of the hole, where they still remain. I have not seen the woodpecker since, but I hear him daily among the neighbouring trees."—*J. H. Gurney.*

Greater Spotted Woodpecker near Farnham.—I saw a pair of these birds near Farnham on the 23rd of May. I believe these birds to be rare in this part.—*W. H. Legg; Farnham, Surrey, May 23, 1874.*

Pratincole at the Lizard, Cornwall.—I had an opportunity yesterday of handling an adult full-plumaged bird of this species, which was captured

near the Lizard on Monday last. There was nothing peculiar in the colour of the plumage from the general description of the adult bird by Mr. Yarrell. I may remark, however, that instead of being ten inches in length, this bird was fully ten and a half inches, the wings exceeding the tail by at least half an inch; the exterior tail-feathers taper away into almost a filament. In handling the bird in the flesh, it was quite bewildering to try to reconcile its characters to the place it ought to take in our British Avifauna; for in the character of its beak you could understand its claim to the family of swallows; we must take leave of the forked tail as a character of the swallow tribe, and allow this feature to claim its kindred to the terns, with which it has been associated; but when you look at the feet and tarsi and the naked part of the tibiæ, you are at once drawn to the stints and sand-pipers, with which it has been associated, and then, knowing that the bird is found on open downs and dry pastures, and that it has extraordinary cursorial powers, with a tone of plumage and mode of flight not unlike the common dotterel, you are tempted to be reconciled to the place now allotted it by our naturalists, by the side of the plovers. There is a record of the pratincole having been obtained in Cornwall once or twice many years ago; but this is the first example of a bird in the flesh coming under my notice.—*Edward Hearle Rodd; Penzance, June 10, 1874.*

PS.—The bird was observed, by a boy who was coot shooting, flying backwards and forwards over a large pool on the Lizard downs, exactly like the swallow tribe, and apparently hawking for insects. It alighted for a time on the margin of the pool, where it was shot. Sex male.—*E. H. R.; June 16, 1874.*

Note on the Voracity of a Tame Duck.—The following statement was communicated to me early in the present month (June) on what I believe to be perfectly reliable authority. A gamekeeper at Swanton Abbot, in Norfolk, lost thirteen newly-hatched pheasants, which he was bringing up under hens. They disappeared one after another without his being able to account for their loss, till at length a tame duck, which was sitting on her eggs not far off, was observed to leave her nest and make her way to the pheasant-coops, when she seized a young pheasant in her bill and swallowed it whole. The inference that she had also swallowed the thirteen pheasants which had previously disappeared seems to be a reasonable one.—*J. II. Gurney; Northrepps, Norwich, June 12, 1874.*

Iceland Gull.—I have in my collection a specimen of this rare gull in a curious state of plumage, having the legs of the adult, breast and back of the second year, while the head and bill are apparently those of the young bird. It was shot by a fisherman, some two months ago, between Hastings and Rye. He said that he had observed it, in company with another of the same kind, for two or three days before he shot it, and that he knew they were strangers by their white wings. Mr. Knox mentions, in the third

edition of his 'Ornithological Rambles,' that an immature Iceland gull was shot in January, 1852, near Pagham: it is now in the Chichester Museum. —*Arthur John Clark-Kennedy; Little Glemham Rectory, Wickham Market, Suffolk, May 20, 1874.*

The Bite of a Viper.—To be bitten by a viper in our country is such a comparatively rare occurrence that perhaps it may not be uninteresting to your readers to hear of a really authentic case which occurred quite recently in the immediate neighbourhood of London. On Sunday, May 2, a young man, F. G., aged twenty-eight, was lying on the grass in Epping Forest, between Loughton and Buckhurst Hill, and in stretching out his arm backwards he unintentionally brought his hand down upon a snake, which immediately bit him upon the first joint of the right fore finger. He at once killed the animal, his description of which will only answer to that of a viper, and went in search of a medical man, who applied nitrate of silver freely to the sore and bound a bandage tightly round the fore arm. Some hours afterwards he was brought to University College Hospital, when he came under my observation, and gave the following account of his experiences. The first thing he noticed was that there were two minute wounds on his finger, which were bleeding freely. Very soon the part began to swell and two blisters formed round the wound; at the same time he felt faint and unwell, and was very sick. He vomited in all four times, once within ten minutes of the accident, and the last time four and a half hours afterwards. Pain and redness rapidly extended up the arm and increased for some hours, the sense of discomfort continuing; but by next day the pain and uneasiness had disappeared, and though the swelling remained for some time, it also gradually subsided. In the course of a few days extensive bruising came out over the whole limb; the blisters on the finger were pricked once or twice, and ultimately a rather deep ulcer formed at the wounded part, which has not yet (June 4th) completely healed. It is possible that the swelling and subsequent bruising may have been partly owing to the ligature, which seems to have been applied somewhat heroically to the fore arm. In conclusion, it may be advisable to remind your readers that, in the case of an injury from the tooth of an adder, or any animal whose bite is supposed to be venomous, the best course to pursue is immediately,—even before killing the animal in question,—to suck the wound, of course remembering not to swallow the material so obtained. The danger from the contact of the poison with the mucous membrane of the mouth, unless there be a raw surface there, is extremely slight, and the chance of preventing mischief in this way is by far greater than from the most extensive application of any caustic with which we are acquainted.—*Rickman J. Godlee.*

Fox Shark off Scilly.—A fine specimen of the thresher or fox shark (*Carcharias vulpes*) was recently taken in mackerel drift-nets off Scilly, and has been on exhibition in the Corpus Christi Fair, held here to-day. It measures over all thirteen feet, consisting of—from snout to eye, four inches; from eye to fork six feet four inches; and from fork to extreme tip of the tail six feet four inches. I could not ascertain its weight. The pilot-fish has also again been taken here.—*Thomas Cornish; Penzance, June 5, 1874.*

Dorse near the Lizard, Cornwall.—I have had brought to me a dorse, two feet six inches in length over all: it was caught near the Lizard. I mention the fact that I may, by an accumulation of instances, prove that it is a fish which is not rare in British waters. It is worth catching for another reason. It spawns early in the year, and, having recovered, is in good edible condition.—*Id.; June 10, 1874.*

Note on a Pied Lobster.—On the 11th of June a lobster of about three pounds weight, considered by the fishermen to be a female, but with no spawn attached, was caught about a mile off Cromer, in which the normal colour was curiously intermixed over the whole surface of the animal with pale yellow or yellowish horn-colour. I saw this lobster alive, and observed that this pied appearance was present on the body, head, tail, legs, claws, and even on one of the antennæ (the other having been lost). I may add that the irregular intermingling of the two colours closely resembled the ordinary markings of tortoiseshell.—*J. H. Gurney.*

Proceedings of Scientific Societies.

ENTOMOLOGICAL SOCIETY OF LONDON.

June 1, 1874.—Sir SIDNEY SMITH SAUNDERS, C.M.G., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors;—‘Transactions of the American Entomological Society,’ vol. ii. nos. 2 and 3; vol. iv. nos. 1—4; presented by the Society. ‘Bulletin of the Buffalo Society of Natural Sciences,’ vol. i. no. 4; by the Society. ‘Bulletin de la Société Impériale des Naturalistes de Moscou,’ 1873, no. 3; by the Society. ‘Coleopterologische Hefte,’ xii.; by the Editor, Baron E. von Harold. ‘Berliner Entomologische Zeitschrift,’ 1873, 3, 4; 1874, 1, 2; by the Society. ‘The Journal of the Quekett Microscopical Club,’ no. 26; by the Club. ‘The Canadian Entomologist,’ vol. vi. no. 4; by the

Editor. 'The Entomologist's Monthly Magazine,' for June; by the Editors. 'Newman's Entomologist' and 'The Zoologist' for June; by the Editor. Butler, 'Lepidoptera Exotica,' pt. xx., and 'Cistula Entomologica,' pt. ix.; by E. W. Janson. 'The Lepidoptera of Turkestan, from the Collection of M. Fedtschenko,' by M. Erschoff; by the Author. 'Stettiner Entomologische Zeitung,' vol. xxxv, nos. 1—6; by the Society.

Election of Members.

M. Achille Guenée, of Chateaudun, France, was balloted for and elected an Honorary Member of the Society, in the room of M. Guérin-Méneville, deceased.

Mr. Alan Ogier Ward, of Putney, was balloted for and elected a Subscriber to the Society.

Exhibitions, &c.

Mr. M'Lachlan exhibited specimens of the white ant (*Calotermes* sp.), recently bred at Kew from a sample of the wood of the tree (*Trachylobium Hornmannianum*) that produces the gum copal of Zanzibar.

Mr. Stainton read a letter he had received from the Rev. P. H. Newnham, of Stonehouse, Devon, stating that he had taken two living specimens of *Deiopeia pulchella*, on the opposite side of the river Tamar, in Cornwall. Mr. Stainton remarked on the unusual circumstance of the insect having been captured at such an early season as the month of May.

Mr. Charles O. Waterhouse sent for exhibition a living specimen of a Mantid (*Empusa pauperata*), in the larva or pupa state, brought from Hyères by the Rev. Mr. Sandes, of Wandsworth. The captor stated that he had supplied it with flies, &c., in the hope of ascertaining the mode in which it seized them, but that he could not induce it to eat anything while he was looking on. Mr. Stainton suggested that if he had put a living spider in the cage it would probably have seized it immediately.

The Secretary read the following note, which he had received from Mr. William D. Gooch, of Spring Vale, Little Umhlanga, Natal, respecting the habits of the Longicorn "coffee-borer of Natal:"—

"The egg, as far as we can determine, is laid about the level of the soil, about the middle of December, at a time when the trees look most healthy, are making most wood, and the circulation of the sap is most free, it being also during the damp part of the year. I have, however, despite considerable investigation, been unable to get specimens of the egg, and so watch the development of the larva from the earliest stages.

"Specimens of the larva have already been laid before the members of your Society, but I forward by this post also some specimens.

"In only three cases, about January or December, have I met with any insect in the bark, between the level of the ground and the roots, at all corresponding to the larger insect found in the wood. On examining those

trees with larvæ in, with hardly any exception, we discover the bark eaten away, or rather, I should say, wanting about the level of the ground; from this place to the entrance-hole of the borer in the forks of the roots there is always to be observed a more or less irregular channel or road cut in the bark leading from one to the other, and in this channel I discovered two of the three small specimens of larvæ mentioned above. The entrance-hole of the larva is very irregularly placed; sometimes it begins as an excavation along one of the roots at a fork in the rootlets; sometimes it enters immediately under the first root, hardly below the ground. I have not noticed the entrance of the larva above ground, except in two instances, when there was a hole below the lowest primary in one case and the second primary in the other. I did not, however, satisfactorily determine that these were the same insect, or even if so, they may be considered as accidental cases. The excavation of the wood of the tree by the larvæ need not be entered into, as every one must be well aware of their powerful mandibles and their unlimited appetites. How long the insect remains in the larva form I have not yet been able to judge; but in consequence of finding always two and sometimes three distinct sizes in the insects taken out of a hundred trees, I imagine not less than two years, and possibly so long as three. The first transformation at present I have only observed in October; but I am half inclined to think there is a double brood, and another transformation about May: as I was not in the colony at that time last year, having given my attention to the question since July last, I am looking forward next month to deciding this point, as unluckily we have many diseased trees to operate on.

"I enclosed with the larva formerly sent to you a specimen of the pupa; it was first discovered about the beginning of October, and was found till the middle of December. The first perfect insects were found in the beginning of December and the last week in November.

"The imago, from the name, I imagine to be *Anthorea leuconotus*, a longicorn, with the elytra covered with very fine down, almost a bloom, and grayish colour, the bases of the elytra being of a reddish chocolate, with a purplish shot on it when newly emerged. The insect, I think, lies torpid after its complete transformation till some 'drying day' comes, when it bores its way out; but what happens to it afterwards I have never been able to discover: only three specimens were found on the whole estate, although I offered sixpence each for them, and we were splitting trees with two and three perfect insects in them each. When I speak of a 'drying day,' I mean one of the 'hot winds' from the north-west, which occur in our spring here, taking the thermometer up to 100° in the shade, and considerably affecting insect-life. I noticed especially that the morning after one of these hot winds, on splitting some of the trees, the insects looked so lively that we left off splitting in haste, and gathering the trees together in large heaps

burnt them straight off. I said before that only three insects were found at large on the whole plantation by our people; of these two were *in copulâ* on a primary branch of a coffee-tree, the bark of which had been eaten away. This at once suggested to me whether the female before depositing her eggs may not decorticate a small portion of the trunk for the purpose of depositing? I did not see a single specimen on the wing, and in many cases I found the elytra so hard to open that they seemed soldered; nor could I by exposure to the sun or any other means ever induce the perfect insects to take wing; they always crawled.

“So far I have dealt with the insects; I may now add, in reply to some remarks communicated by you in your minutes, that Mr. Keit, the Botanical Curator of our Gardens here, recommended by Dr. Hooker, says that he sees no cause whatever to believe the trees die from any want of vitality, nor do they seem specially affected in any way, yielding good crops and looking well till the borer has very often emerged, after which they languish and die rapidly. I hear from other managers, *on strong soils*, that very often on one aspect, N. and N.E., they find the developed grub as much as 90 per cent., but that, in the same valley, the opposite slope, S.W. and S.E. (our cold slopes), the insect is *not* present above 5 per cent, although the mortality of the trees is about the same. From this I gather either that the insect is a secondary cause, or that the cold aspect is not favorable to the development of the insect beyond the stage when they have damaged the bark, and so more or less killed the tree. In slopes it is noticeable that the lowest side of the tree is that attacked, where by washing from rains the more tender bark is exposed, and very likely the draught cracks a little. My proposed remedies and *modus operandi* for the prevention of this evil are as follows:—

“1. To remove all trees which are visibly affected before the insect matures. This, through non-comprehension of the cause of disease, was not done, and our estate and the adjoining one have suffered by the presence of so many centres of evil left to take effect upon the surrounding coffee.

“2. About the time the egg or young insect is still in or under the bark, to keep a staff of men rubbing the trees round the roots with iron gloves, or sticks, with sand, so as to crush the insect in its larva-state.

“3. About the time the insect emerges, to keep boys hunting for and picking off the beetle as it adheres to the tree.

“4. To let the same boys search for newly-made holes of emergence, and pass wires, &c., down them, so as to destroy the insects therein, in case the beetle should have the habit of re-entering the hole as a *cache* during the day.

“Your member's suggestion as to the non-destruction of insectivorous birds is a very good one; but I am afraid they are too few, or rather the

insect-life is so immense, that they will not play a very important part in helping us. No one shoots birds in the bush round us."

Referring to one of the modes adopted by Mr. Gooch for killing the larvæ, Mr. Dunning suggested that rubbing the bark of the trees round the roots, as stated, would hardly have the desired effect, and would probably damage the tree more than the insect. Dr. Horn (of Philadelphia) also doubted the efficacy of the remedy of inserting wires in the holes, which he compared to shutting the stable-door when the steed was stolen. He stated that in Philadelphia a public park had been planted with a great many different kinds of exotic trees, and amongst them were some pines, which were all destroyed by two of their native species, *Callidium antennatum* and *Monohammus dentator*. None of their native trees suffered, but the foreign Coniferæ were killed immediately. Dr. Horn also stated that it was his belief that the Longicorns attack healthy trees, and that the Coniferæ in question had been previously noticed as the finest and healthiest young trees in the park. The lime trees from Europe were also destroyed in a similar manner by hosts of Saperdæ. Mr. M'Lachlan repeated what he had stated on a former occasion, that European entomologists generally were of opinion that the majority of the European species of Longicorns do not attack living trees while in a perfectly healthy state.

Papers read.

Mr. A. G. Butler communicated a paper entitled "Descriptions of some New Species and a New Genus of Diurnal Lepidoptera in the Collection of Herbert Druce, Esq."

M. Henri Deyrolle communicated some "Descriptions of New Species of Lucanidæ, from the Collection of Major F. J. Sidney Parry."

Mr. Frederick Smith read a paper entitled "A Revision of the Hymenopterous Genera *Cleptes*, *Parnopes*, *Anthracias*, *Pyria* and *Stilbum*, with Descriptions of New Species of those Genera and also of New Species of the Genus *Chrysis* from North China and from Australia." With regard to the genus *Anthracias* in the above paper, Mr. Smith remarked that a genus had been created by Klug, in the 'Berichte,' under that name, but that the detailed generic characters had not been given, although he had mentioned the essential one,—that of the abdomen being composed above, of only two (visible) segments, instead of three, as in the other Hymenoptera. No mention had been made of it by any other hymenopterist, and nobody appeared to know anything about it; but latterly he had purchased the collection of Mr. Shuckard, and in it he had found a single imperfect specimen, which was undoubtedly belonging to the genus described by Klug. It was mixed with specimens of *Parnopes carnea*, for which it had no doubt been mistaken, and which it very much resembled.—*F. G.*

Notices of New Books.

Introduction to the 'Birds of Great Britain.' By JOHN GOULD.

London: Printed for the Author. 1873. Demy 8vo, 135 pp.

Price five shillings and sixpence.

IN pursuance of the course which he adopted when preparing the introductory matter of his works on the 'Birds of Australia,' the 'Mammals of Australia,' and the 'Monograph of Trochilidæ,' Mr. Gould has had this Introduction to the 'Birds of Great Britain' set up in smaller type for the convenience of correcting before printing it in the folio form. This smaller work is not, therefore, in any way intended as a substitute for the letterpress of the folio work, but rather as a general summary accessible to all, the price of the complete and splendidly illustrated folio being prohibitory to such ornithologists as myself, men who have the same taste for Birds as the Regal and Princely subscribers to the more expensive luxury, but not the same means of indulging that taste, and who must therefore perforce be contented with this "general summary," in perusing which they will find much that is instructive and comparatively new, although, like an auctioneer's catalogue, it gives but a very superficial idea of the treasures enumerated. Still this smaller production contains some statements with which I cannot altogether agree, and a classification which seems unaccountably retrogressive, in the face of the more extended knowledge which the author has abundantly shown himself to possess, of the immature states of his feathered friends, knowledge that should, as I think, have been digested and arranged—in a word, "utilized"—for our instruction.

Unfortunately for me, this announcement will elicit a smile of something like contempt from my readers, most of whom would doubtless consider Mr. Gould infallible, and far above the reach of any criticism of mine; still the office of critic is compulsory, and honesty in criticism is a duty: therefore I proceed. At p. 15 of Mr. Gould's work it is stated that toucans, trogons and humming-birds are confined exclusively to the New World. I thought it was otherwise; I will not cite Mr. Stanley, who has peopled the banks of Tanganyika with gorgeous toucans, or Mrs. Haines, whose highly poetic spirit was charmed with the metallic humming-birds of

Bombay. I decline this support to my opinion, because the authority on these instances may be doubted, or perhaps denied; but while rejecting the evidence as regards these two beautiful families of birds, I think it might be shown that my objection to Mr. Gould's statement holds good as regards the trogons, several species of which have been recorded as inhabitants of the Eastern Archipelago, and one as native on the continent of Africa.

Again, I think there must be some mistake, probably a printer's,—for they make sad havoc of an author's meaning,—in placing the willow wrens and the goldcrests in the family Certhiidae: it is easy to trace something of a connection between Phyllopneuste and Regulus through the delicate Reguloides, but I think not with Certhia. Mr. Gould calls this a “singular bark-loving family,” an epithet very easy to understand when applied to Certhia and Tichodroma, but which appears singularly inapplicable to the group as extended by himself.

On the subject of partial or unaccepted migration Mr. Gould has much to say. In June, 1845, I revived, in the pages of the ‘Zoologist’ that truthful paragraph in Bewick's ‘Birds’ which begins “Most birds are in some measure birds of passage,” and then I went on to show that the phenomenon of partial migration was of more frequent and more extended occurrence than is generally supposed; I found that the so-called “soft-billed” or insectivorous birds were by no means exclusively the migrants, but that the hard-billed birds, the inveterate and determined seed-eaters, were also addicted to travel, and left the place of their nativity in large flocks as soon as they were thoroughly able to shift for themselves. I instanced the goldfinch, which is abundant at Leominster throughout the spring and autumn, but retires before winter, and is heard and seen no more until it returns to our gardens and orchards in the spring, and resumes the duties of nidification, incubation and increase. Ornithologists, of course, expressed their dissent; but, so far as I recollect, attributed my misstatements entirely to ignorance, and acquitted me of all intention to mislead.

Mr. Knox, however, some years later (at p. 75 *et seq.* of his ‘Ornithological Rambles’), not only confirms the statement, but gives corroborative evidence from a variety of sources, more especially personal observation. He describes the manner in which the migrants arrive on the coast of Sussex in the autumn, gradually

moving eastward in order to pass the sea at the narrowest part. "The advanced guard of this emigrant host," says Mr. Knox, "usually makes its appearance in the neighbourhood of Worthing, Shoreham and Brighton, about the latter end of August or early in September, and is generally composed of detachments of meadow pipits, pied wagtails, tree pipits and yellow wagtails, the two first-named species being generally understood to be permanent residents in England during the whole year. Many of these birds certainly do remain with us during the winter, but I am disposed to think that these are the natives of more northern and western counties, which having proceeded thus far towards the south-east are, as it were, satisfied with this partial migration, and do not cross the Channel, unless subsequently compelled to do so by unusual severity of weather at a much later period of the year." I pause to say that I cannot accept this solution as satisfactory, for if the migratory flock waited on the coast until compelled to cross by stress of weather they must soon become uncomfortably crowded, and again we rarely find birds migrating in any numbers in the winter season; but I will proceed with Mr. Knox's account of unaccepted migration, which precisely corresponds with my own views and my own repeated observations. "But the troops of these autumnal voyagers do not consist merely of dentirostral or exclusively insectivorous birds; the conirostral tribe furnishes many recruits; goldfinches, linnets, and greenfinches pass in considerable numbers, and such multitudes of the first-named species are occasionally taken that the market of the song-bird dealers is completely glutted with them, even their most capacious family cages being completely filled with recently captured goldfinches." A Mr. Robert Gray, of Worthing, a few years later, writing in the 'Zoologist' for 1860, states that he has made it his especial business to inquire about the number of goldfinches transmitted every autumn from that place to London for sale, and found it amount to eight hundred dozen in six weeks. The Rev. Arthur Hussey, of Rottingdean, gives in the same periodical, and at the same date, some additional particulars of this extraordinary branch of industry. He writes thus:—"In a statement I have received from one of the bird-catchers here he gives the enormous number of 13,848 goldfinches per annum as sent from Worthing alone, but the statement is so made that it may be somewhat fallacious. Only four of the catchers send the birds to London, three or four always taking what the

others catch at the rate of four shillings a dozen. For their own protection in settling accounts with the London purchasers, the above four are obliged to enter in a book the number sent. I applied to the most respectable among them, and he has his book still, but two have not kept them, so that I could not get the numbers correctly, but this young man said he knew exactly how many went out catching, so that, reckoning each man's share to be equal, it gives the prodigious number before mentioned. The birds are sold to the dealers at five shillings a dozen for males and two shillings a dozen for females." The following statement of the number of goldfinches caught at Worthing in a year is from the same source:—

In January, February, March and June, none.

April	-	-	-	-	-	about 4 dozen.
May	-	-	-	-	-	„ 10 „
July	-	-	-	-	-	„ 5 „
August	-	-	-	-	-	„ 15 „
September	-	-	-	-	-	„ 20 „
October	-	-	-	-	-	„ 750 „
November	-	-	-	-	-	„ 300 „
December	-	-	-	-	-	„ 50 „
Total						about 1154 dozen.

Hence we may conclude the migration of seed-eating birds is a phenomenon as regular, though not so complete, as that of the insect-eaters.

It seemed desirable thus to travel over the previously explored ground, before quoting Mr. Gould's valuable observations both on migration generally and on partial or unsystematic migration: I now take up the former theme, quoting Mr. Gould:—

“Besides being tenanted by about one hundred and fifty stationary species, Great Britain has migrants and occasional visitants from the four points of the compass; thus, in spring, nearly fifty species visit us from the south—whilst in the autumn our milder and more equable climate attracts a still larger number from the north, who instinctively know they will here find that food and shelter, which the rigorous winters of more northern regions deny to them. In addition to this true and characteristic migration, our islands are occasionally resorted to by certain species which, from some unknown cause, make a movement from east to west; whilst the pseudo-migration from west to east is exemplified in the rarely occurring American

forms which from time to time have been recorded, and which, blown off from their native shore, find in the masses of sea-weed, uprooted trees, and portions of wreck constantly approaching our coasts through the agency of the Gulf-stream, that means of rest and recruitment which finally enables a few of them to reach a welcome though far distant haven. A remarkable degree of capriciousness, which to me has always appeared mysterious, occurs in the choice of localities affected by certain of our migrants: thus the pied flycatcher will not rest until it has reached the middle and northern counties of England, while the nightingale almost restricts its visits to the southern, eastern, and central ones, never favouring Cornwall with its presence, and but rarely going into Devonshire or Wales, or further north than Yorkshire or Durham. Again, some species, exemplified in many of the plovers and sandpipers, make our islands but a halting-place, pausing for rest only on their way to unknown and probably far distant regions.

“The mysterious law or laws which govern migration must always be regarded by the naturalist with the utmost interest. Within our own islands hardly a month passes by without the movement of some species occurring to remind us of the existence of such a principle. In the early spring, before the wheatear, that earliest of our visitors from the sunny south, has arrived, the fieldfare and redwing, which during the winter have peopled our hedgerows and fields, the geese, ducks and numerous wading-birds which have been frequenting our broads and rivers, have, in obedience to Nature’s prompting, commenced a movement northward, *en route* for localities better suited, by the quietude and by the nature of the food found there, for the propagation and rearing of their progeny; then, as the rays of the life-inspiring sun strike upon our earth with daily increasing strength, we begin to welcome in quick succession those little feathered arrivals which make the spring and early summer seasons of so much enjoyment and anticipation to all true lovers of Nature. March, besides the wheatear, brings us the chiffchaff and the sand martin; April’s earliest days herald in the swallow, wryneck, and martin; by the middle of that month the nightingale has made its appearance, together with a host of other sylvan species; soon after, the cuckoo and landrail arrive; and on the joyous first of May the latest of all comers, the swift, the nightjar and flycatcher may be looked for. A pause of a few weeks follows; and, reproduction having been accomplished, then commences, as it were, the ebb of the great tide of migration. The swift, which, as we have seen, was one of the latest to arrive, is the first to depart; then the landrail makes good its retreat to the more southern country of Africa; other kinds follow in succession, all hastening to make their escape before such changes of climate and natural conditions have set in as would prove fatal to their existence, either on account of the lowering of the temperature or the cessation of suitable food. By the end of September, the great mass have departed, and only

a scanty remnant are to be met with. With this same ebb the autumnal months bring to our sight again strings of grallatorial and natatorial birds, urged by similar causes from the northern regions back towards the south in search of that food and aquatic life which the icy hand of winter had already begun to grudge them and their progeny in their summer location. To follow the sun appears to be the course of true migration; but the promptings of instinct which lead the swallow and many other species to quit our shores, after a brief sojourn, for Africa, or those which lead the fieldfare and the redwing to quit the Norwegian 'fjelds' for our cultivated lands, must surely be connected in some way with, if they have not for their sole object, the provision of food and climate suitable to the species."—P. 3.

Mr. Gould has some very truthful and appropriate observations on the difference in punctuality between immigration and emigration, the regularity of arrivals manifestly exceeding that of departures; but I cannot find that he throws any additional light on this most interesting subject, and it is well worth deep and attentive study: it is a matter of constant astonishment to me that ornithologists devote so much thought, ingenuity and research to the changing of a Latin name, and so little, so infinitesimally small a portion of either, to observing the habits and actions of the living bird. This taste or fashion now prevails to such an extent that the use of scientific names must inevitably be abandoned altogether before many years have passed over our heads, and each country must adopt its own vernacular names, and thus shut itself up in a mantle, so to speak, of its own ignorance. But let us proceed to Mr. Gould's exposition of the facts of partial migration.

"Besides the regular migration of certain species, a remarkable shifting of locality occurs with others, not only in our own, but in many other parts of the world, the cause of which is totally unknown. Starlings are now very abundant in Cornwall, and missel thrushes in Scotland—in which they were formerly not to be seen. Such interchanges of locality are doubtless occasionally due to alterations in the face of the country: but this was not the cause in the case of Cornwall; for no county can have undergone less alteration; as it was in the days of Julius Cæsar so it is now, unless we except the operations of mining, which naturally only affect the surface of a district to a small extent. The sudden appearance of Pallas's sand grouse (*Syrhantes paradoxus*) in our islands and on various parts of the Continent, in 1859—60, must be in the recollection of every one.* This irruption of a strange bird from the distant country of Siberia, perhaps from China, was very astonishing; and it well illustrates my meaning, which may be further exemplified by the mention of two similar occurrences in Australia. In the

year 1839 the whole of the southern and eastern portions of that country was suddenly visited by millions of the little grass parrakeet (*Melopsittacus undulatus*); and a year or two later swarms of a species of waterhen (*Tribonyx ventralis*) spread themselves like a cloud over the Swan-River district, destroying fields of corn and garden-produce and committing ravages unheard of before; and both the species have kept their hold until the present day, but of course in much smaller numbers. Although not necessarily bearing upon the preceding remarks, it may be here mentioned that young birds appear to wander further from their native homes during the first autumn or year of their existence than they do afterwards, going out, as it were, to see the world before settling down for the proper business of their lives; hence, doubtless, it is that the young of so many of the rarer northern species (eagles, gulls, divers, &c.) are found further to the south than the old birds."—Page 7.

The observation that the last remark does not necessarily bear on the subject of partial migration, is a very true one: equally truthful is the statement that young birds go further in any given direction than the old ones. I have often observed this on a limited scale among our noteworthy birds of whatever species; thus we read, in the pages of the 'Zoologist' or the columns of the 'Field,' of the slaughter of a golden eagle, a whitetailed eagle, an osprey, a peregrine, &c., in some out-of-the-way and therefore unexpected locality, and we invariably, or almost invariably, find the announcement accompanied by the words "a bird of the year," or "in immature plumage," or "nestling plumage," or some similar explanation that it was not a mature and adult bird travelling for its own pleasure or on its own business. I deduce from long-continued observation of birds, whether perfectly at liberty, as hawks or robin redbreasts; in a state of half-liberty, as pigeons, doves, and bedcherrygahs; or in more strict confinement, as canaries, that parent birds will allow none of their children to remain near the family seat (as we may consider the nesting-place) after they are able to provide for themselves. This seems all but a universal law of Nature, and of course tends to many manifest results; such, for instance, is the leaving to the parents the means of sustenance which they had always enjoyed; and such also is the dispersion of the species over a larger area, and thus preventing that crowding on a limited space which is always prejudicial to the welfare of a species. Although this fact is so well known to the preservers of game, yet with strange pertinacity they adhere to the

extermination of "vermin," as they call eagles and hawks, until the race of game-birds is unnaturally crowded, and, as a consequence, is sensibly depauperated. Nature, ever wiser than man, makes equal provision for the preservation of all her tribes; she designs that each shall possess that rood of ground necessary for its maintenance, and so she entrusts the parents with the necessary duty of driving the young ones away and bidding them shift for themselves. Hence the fact that young birds wander farther south or farther north, as the case may be, than the old ones, and thus also it happens that the rare birds recorded in the 'Zoologist' are in immature plumage. I could gladly have enlarged on this interesting topic; but my readers will prefer hearing Mr. Gould, who thus continues:—

"Although in the foregoing remarks I have used the terms migrant and migratory in their ordinary acceptation, it will be as well before quitting the subject of migration to place before my readers what I consider should be the strict meaning of the word 'migrant.' The country a bird resorts to for the propagation of its species should be regarded as its true habitat: thus the swallows and others, although they pass only half the year in the British Islands, are really not migrants in the same sense of the term as that in which we should so regard the fieldfare and redwing, who, although resident with us during the winter, retire to Norway and other northern regions for the purpose of breeding, and who are impelled to visit our country solely to obtain the food necessary for their existence. But whilst regarding the species visiting us from the north during the winter months, such as the woodcock, ducks, fieldfares, redwings, &c., as true migrants only, it must be recollected that the swallow, chiffchaff, cuckoo, &c., species leaving us at the same portion of the year, are migrants so far as the countries they respectively winter in are concerned."—Page 8.

On the subject of acclimatizing species or transplanting them from one region to another, much difference of opinion prevails, and Mr. Gould has done wisely to give it his attentive consideration: his conclusions are evidently opposed to those in the mind of every adventurer, that we have only to tether an animal to our own door-post, in whatever continent or clime we may be pleased to settle, and it will thrive there. Let those who think so look plainly at fact. Have we utilized the zebra, the most beautiful of all quadrupeds? He would fetch some hundreds of pounds in Britain without difficulty, yet after attempting his introduction for two thousand years we give it up in despair. Nature has laws which she refuses to

abandon to our bidding; she says, take the rabbit of New Zealand and welcome, but do not bring the zebra to England; and yet the transit is easy in both cases, and so in hundreds of others.

“Man has frequently been induced to try his hand at the introduction of certain species, the acquisition of which he has considered desirable; such attempts have generally proved futile; Nature having adapted each for a certain locality, the climate and the condition of the country must be altered and rendered fit for the reception of either bird or quadruped before there is the slightest chance of their successful naturalization. Many persons have been desirous of establishing the North-American prairie hen (*Cupidonia Cupido*) on our moors, and the *Ortyx virginianus*, or American partridge, in our fields and coverts; but what good would be affected thereby? The prairie hen would but displace a better breed, the common grouse; and the little partridge would be no improvement upon our familiar species. There is no fear, however, that this will ever be accomplished; and the sooner such fallacies are ended the better. It would be far wiser were the efforts of our well-meaning patrons of acclimatization directed rather to that interchange of blood among the same species which is essential to the maintenance of a healthy stock. I am sure it is all-important with regard to our birds, particularly those that are stationary. It is well known that species that have lived long on an island without a sufficient interchange will diminish both in size and brilliancy of tints; and hence, perhaps, may be explained the smaller size and more subdued colouring of many of our birds, compared with continental examples. The blackcock of Norway and Switzerland will be found to have the tone of its plumage more intensified than those inhabiting Scotland, the black being unmistakably of a darker hue, and the gloss of its feathers more resplendent. The Norwegian ptarmigan, too, is of a purer white compared with our own bird, while its full summer dress is much darker. So, again, the longtailed tit (*Mecistura caudata*) of Norway and Denmark differs in having a white head, while that of Great Britain has the crown and face dark or obscurely striped; and the cole tit (*Parus ater*) of Belgium in having the back gray, instead of the slight olive tint seen in British examples. To make such differences, however, grounds for specific distinction, as has in some cases been done, is in my opinion playing with science. That the drier and more rarefied air of the Continent, coupled with the more direct influence of the solar rays, contributes to cause these slight differences, seems to me highly probable; and I am strengthened in this view by noting that among such groups as the Trochilidæ, or humming-birds of America, some of the richest and finest colours are seen in species that frequent lofty situations.—P. 15.

On the subject of pheasant breeding Mr. Gould touches very slightly, and fails to throw much light thereon: he writes of the

Chinese pheasant as though it were a distinct species, and yet speaks of our pheasant being brought about by the *intermixture of three kinds*; this seems rather unsatisfactory. Supposing them to be species, there is no probability of intermixture; supposing them geographical varieties, the intermixture is a matter of course: we wish the term *kinds* had been avoided. Mr. Gould proceeds thus:—

“Most of the pheasants now spread over every county of the British islands are mongrels, brought about by the interbreeding of three kinds, and their progeny are but too often rickety and sickly creatures.

“Whilst on the subject of interbreeding, I should wish to draw the attention of sportsmen to the advantages likely to accrue from the interbreeding of our grouse with that of Norway (*Tetrao Saliceti*). Ornithologists are questioning whether these are not one and the same species, and if the differences existing between the two may not be due to the influence of climate. Should such be the case (and I think it probable), then the introduction of the original stock would doubtless effect an improvement in the health and vigour of our birds. Prof. Rasch, of Christiania, believes the two so-called species to be identical, and is introducing our grouse into his country, partly to determine this point, and partly for the sake of the infusion of fresh blood.”—Pp. 15, 16.

The subject, however, is too interesting to be dropped, and I am sure no one will object to another passage exhibiting the result of Mr. Gould’s “ample experience,” every word of which will be read with interest.

“Had I not had ample experience on the subject of naturalization, I should not have prolonged these remarks; but having for the last forty years been a close observer of the denizens of the Gardens of the Zoological Society of London, a Society justly popular for its interest and usefulness, I have not failed to note that, however high our hopes may have been raised respecting the probability of the successful introduction of many valuable species, nothing but bitter disappointment has been the result. Two or three instances will suffice. Soon after the arrival of the beautiful mandarin ducks they commenced laying, and hatched out several clutches of young: it was therefore only natural to infer that this lovely denizen of the Celestial Empire would hereafter grace our ponds and lakes; but such has not been the case, and very sparingly indeed does the bird breed after the second or third year of its introduction. Three species of the equally beautiful *Cerionithes*, or so-called horned pheasants, have at one time or other also graced the gardens, and gave early evidence that they would reproduce their kinds; and many of them did so; but, alas! the same result followed; for in a very few years all, both old and young, sickened and died. A like

fate attended the fine *Crossoptilons*; they laid freely, and a numerous progeny were raised during the first two or three years: but they ultimately all perished; and thus these fine and rare members of the *Phasianidæ*, which formed unrivalled ornaments to the Gardens in 1870, were in 1872 not to be seen. Many other instances might be cited in support of this view of the impossibility of naturalizing a foreign species. Nature as a rule places each species in the locality best adapted to it; and its removal to any other is pretty certain to end in failure.”—Page 18.

Last of all, we come to the consideration of those physiological characters on which alone a natural classification of birds can possibly be founded. Mr. Gould will certainly have long since forgotten that on the 12th of March, 1850, the late D. W. Mitchell, the indefatigable Secretary of the Zoological Society, read a paper of mine intitled “First Thoughts on the Physiological Classification of Birds.” Mr. Spence occupied the chair, and the dear old gentleman listened to the prosy paragraphs with the most courteous attention. The paper is preserved in the Proceedings of the Society of that date and also in the ‘*Zoologist*’ for April, 1850. Mr. Gould was the only member who considered it worthy of a single syllable, whether in approbation or disapprobation, but he amply made up for this deficiency by the expression of his candid and unqualified disapproval. The salient points were these: I divided birds into two great groups named *Hesthogenous* and *Gymnogenous*, and thus gave the leading characteristics of each:—

“1. *Hesthogenous Birds*.—In these, immediately the shell is broken, the chick makes its appearance in a state of adolescence rather than infancy: it is completely clothed, not with such feathers as it afterwards wears, but still with a close, compact and warm covering. It possesses the senses of sight, hearing, smelling, &c., in perfection: it runs with ease and activity,” &c.

I will not repeat the lengthened characters, but simply state that I included the poultry, cranes, plovers, snipes, rails, divers and ducks.

“2. *Gymnogenous Birds*.—In these, when the shell is broken, the chick makes its appearance in a state of helpless infancy: it is naked, blind, and incapable of locomotion: it gapes for food, but does not distinguish between the proper food offered by its parents and a stick or a finger held over it,” &c.

I again spare the reader further detail, except just to say that I included the pelicans, gulls, birds of prey, herons, all passerine

or insessorial birds, all xygodactyle birds, and the pigeon. It is therefore with peculiar pleasure that I see the value of these characters virtually admitted by Mr. Gould, although he still ignores them as a means of natural classification.

“From the egg to the chick is a natural sequence: and here commences a stage in the life of birds which has been regarded by myself with more than ordinary interest. If any one feature in my illustrations to the ‘Birds of Great Britain’ has special claims to originality it is the representation of the young or infantine state of many of the species; and this I trust will be duly appreciated by those who possess the work. In the imagination of most people young birds are blind, callow, helpless creatures, depending in every way on the fostering care of their parents, and instinctively opening their gaping bills to receive the food assiduously brought to them. Such a helpless condition as this undoubtedly prevails among the young of nearly all, if not all, the Insessorial birds; but compare these with those of other forms, and what vast differences are seen! The tiny offspring of the grebe emerging from its bursting shell in all the vigour and activity of a fully organized being, is immediately capable of clambering, should danger approach, upon its mother’s back, or of seeking security and concealment by diving under a floating leaf. Who is not familiar with the duckling, which from birth equals if it does not surpass its parents in the quickness of its movements and in the skill with which it darts over the surface of the water in pursuit of flies or other insects? As a means to an end (that of continuing its existence unaided), the young duck is as perfect as the old bird, though destitute of the power of flight to be accorded to it hereafter. What the webbed feet and swimming capabilities are to the immature birds above mentioned, the organs of flight are to the chick of the gelinotte or hazlehen, which within a day of its exit from the shell is endowed with such a development of its primaries and secondaries that it can fly from branch to branch or dart after its parents through the wood with an ease and rapidity equal to that of any other little bird. At this early stage the gelinotte appears all wings, and from the down, which alone covers its body, presents somewhat of the appearance of a gigantic moth. The young of the heron exhibit a very low degree of perfection, but those of the crane, the bustard, and the plover are agile on exclusion.”—P. 21.

It is inexpressibly gratifying to me to find so accomplished an ornithologist as Mr. Gould not only admitting, but insisting on, these physiological characters: he never would have done this,—he never would have brought these characters prominently to the front,—unless fully convinced of their importance. Although it may be said he has not yet fully utilized their characters, for pur-

poses of classification, but still adheres mainly to the fanciful quinarian arrangement of Vigors, it is probably because he considers systematic arrangement of minor importance, and prefers adopting the general provisions of a system he finds ready made, to the arduous and most thankless task of constructing a new one.

In conclusion, I may truly say that although quite aware of some little imperfections in the 'Birds of Great Britain,' it certainly lays the foundation, and contains the enduring materials, for the ultimate completion of that natural classification which, taking the diversity of the early stages of independent bird-life for its guide, must sooner or later supersede alike the structural and fanciful systems which have hitherto so perplexed us. All honour be to Mr. Gould for his labours: may they be crowned with every success!

EDWARD NEWMAN.

Transactions of the Norfolk and Norwich Naturalists' Society.
1873-4. Demy 8vo. 86 pp. Id. *Supplement*, 80 pp.

The papers contained are—

I. Fauna and Flora of Norfolk. Part IV. *Fishes*. By John Lowe, M.D.

II. On Breeding Lepidoptera in Confinement. By F. D. Wheeler.

III. On Empusa Musca and other Micro-Fungi. By F. Kitto.

IV. On the Nidification of Prosopis. By J. B. Bridgman.

V. Meteorological Observations. By John Quentin.

VI. Miscellanea.

(*Supplement*). Fauna and Flora of Norfolk. Part V. *Lepidoptera*. By Charles G. Barrett.

Dr. Lowe's "Fishes of Norfolk" is a list prepared with evident care, and interspersed and enriched with notes from a variety of other sources. It is probably known that Mr. Gunn has for years past been preparing for publication in the 'Zoologist' a "Catalogue of the Fishes of Norfolk and Suffolk," and I always regret to see two naturalists expending their energies on the same subject, unless co-operating with each other and intending to make a joint result of their labours. The number of subjects that require the pen of the monographer is now so great, and the field of labour so wide, that I must regard this duplicate production as a somewhat wasteful expenditure of time and talent. In Dr. Lowe's list

I find nothing that calls for comment: it has evidently been carefully prepared.

Mr. Wheeler's contribution "On Breeding Lepidoptera in Confinement" contains little that is very new to entomologists, but certainly a good deal that will be read with interest by beginners; and one passage that possesses considerable interest.

"One constantly recurring cause of failure is the difficulty of getting the sexes to pair: indeed after being bred, in an in, from the same stock, sooner or later all moths refuse to pair. Some do so after the second, and even after the first generation, and all are more or less affected by it. In this case nothing remains but to mix the breed, either with those reared by some friend from a different stock; or still better by pairing with wild males. If the species occurs in the neighbourhood this may often be readily done, the *modus operandi* being simply to tie a piece of fine silk firmly round the base of one of the fore wings [of the female], and having thus secured it to a tree where the insect is supposed to fly, to leave it all night. If the night be favorable, very often the male will be found with it in the morning; so that besides a batch of fertile eggs, you secure an additional specimen. Sometimes, however, a bat or some such nocturnal marauder will find your female, and make a meal of her instead; but on the whole this is a very profitable mode of pairing, as it wastes comparatively few specimens, and the eggs are almost certain to be fertile. I may mention that I have myself tried this plan successfully with *Palpina* and *Ziczac*, while Mr. Harwood informs me that he regularly pairs by this process many of the prominents, the kittens, &c."—Page 59.

There is no better authority on such a subject than Mr. Harwood, whose skill and success in rearing beautiful specimens of Lepidoptera is above all praise.

Mr. Bridgman's paper on *Prosopis*, as Mr. Smith has chosen to call it, *Hylæus* as we old bee-hunting entomologists have known it for years, is very interesting, but perhaps not quite conclusive: he concludes thus:—

"These bees form their nest in any suitable situation, whether in soft wood or earth, not even despising ready-formed holes. At the bottom of one of the cells in the bramble-sticks I found a hard, half-round pellet of some yellow substance, which, under the microscope, turned out to be a mass of regular oval-shaped pellets, closely and carefully packed together, evidently of pollen and honey mixed, each pellet covered with the same gold-beater's-skin-like secretion. Now as the bee has no special organs for collecting pollen, I fancy it must have been collected and carried home in

its mouth after working it up in a pellet. The bee had either forgotten to lay its egg, or the egg had died; it does not matter to us much which; but it has enabled me to state that this bee does collect pollen, like almost and perhaps all other constructive bees."—Page 70.

I may explain here that *Colletes* and *Prosopis* (*Hylæus*) are the two genera of bees that have obtuse instead of acute tongues, and are "the only two that plaster their nests with a peculiar gold-beater-skin-like substance, for which their tongues are admirably adapted."

A word on Mr. Barrett's paper. It may seem an easy thing to take Doubleday's 'Synonymic List' into the woods and lanes, to tick off with a pencil every butterfly or moth observed, to repeat the same process week after week, and even month after month, for four years, and finally, when nothing new turns up, to make a catalogue of all the species so ticked off and send it to the printer; but really a great deal of labour, patience, perseverance and knowledge are involved in the task, and Mr. Barrett has brought all these qualifications to his assistance.

There are comparatively few *Lepidoptera* peculiar to Norfolk; hence although this Catalogue contains a most ample list of species and localities, it has no absorbing general interest, and serves rather to illustrate the industry of the writer, which is most unquestionable, than to extend our knowledge of the science: this observation is by no means peculiarly applicable to Barrett's list; it applies with equal and indeed with greater force to other similar lists which have appeared in all our Natural-History periodicals.

I observe that many previous errors and misstatements are repeated, solely for the purpose of contradicting and condemning them. Thus *Chortobius Davus*, *Thecla Spini*, *Polyommatus Dispar*, *Arcturus Sparshallii* and *Eutricha Pini* are introduced, although Mr. Barrett is perfectly aware, and states explicitly, they have no place in the Norfolk Fauna. There is no misrepresentation, but rather supererogation in this unnecessary detail.

There are apparently six species confined exclusively to Norfolk, so far as the British Islands are concerned; these are *Lithosia muscerda*, *Nonagria brevilinea*, *Crambus paludellus*, and *Sericoris Doubledayana*, confined to the fens; *Crambus fascelinellus*, inhabiting the sandy denes at Yarmouth; and *Nothris verbascella*, attached to the very local mullein (*Verbascum floccosum*), which grows so abundantly around Norwich.

The advantages likely to result from the constant repetition of such names as Rapæ, Napi, Rhamni, Urticæ, Io, Atalanta, Megæra, Janira, Phlæas, Alexis, &c., in this and all similar lists, may very reasonably be called in question; yet it is by no means desirable to omit them, for such omission would itself seem a matter of interest, seeing that their absence from Norfolk would be far more remarkable than their presence.

EDWARD NEWMAN.

Migrations of Spring Immigrants. By R. M. BARRINGTON.

I SEND you the dates on which a few well-known summer migrants have arrived in this neighbourhood for some years past. I regret that the record is not as perfect as I could wish; but as Irish observations are not plentiful these may prove acceptable.

	Cuckoo.	Swallow.	Corn Crake.	Willow Wren.	Chiffchaff.
1866.	April 26.	April 13.	April 26.	...	...
1867.	" 27.	" 19.	" 28.	...	March 25.
1868.	" 26.	" 23.	...	...	" 26.
1869.	" 26.	" 11.	" 28.	...	...
1870.	" 24.	" 9.	" 26.	...	...
1871.	" 26.	" 14.	" 26.	...	...
1872.	" 24.	" 14.	May 1.	April 6.	March 8.*
1873.	" 15.	" 14.	" 2.	" 3.	" 27.
1874.	" 25.	" 8.	April 25.	" 9.	" 27.

Looking at the dates above given, we see that the cuckoo and corn crake make their appearance with tolerable regularity. The swallow is apparently less regular. I refrain from making any remarks on the other two birds until I have accumulated a few more observations.

On the migration of birds in general I venture a few words, which, if not new, have at least the merit of being original. Ornithologists who keep records of the departure and arrival of migratory birds must in the course of time form opinions based on the statistics which they have accumulated. All I would wish to do here is to point out a few circumstances which should, I think, qualify some of the results derived from such statistics. We say that such and such a bird arrives in this country in April, but the

* The earliest date, so far as I can discover, ever recorded in Ireland.—R. M. B.

date on which it appears is very uncertain; another bird is stated to appear with regularity. Again, we say, one bird comes eight or ten days after another, and so on. Let us first consider the regularity with which migrants make their first appearance, and then the average date of the first appearance.

Some migrants are first detected by the ear, as the cuckoo, corn crake, chiffchaff, whitethroat, &c.; others by the eye, as the *Hirundinidæ*, the flycatchers, &c. Those detected by the ear may be subdivided into those which make remarkable and loud sounds, as the cuckoo and corn crake, and those whose note is less striking and less intense, as the willow wren, chiffchaff, whitethroat, &c. Few will controvert the statement that some migrants are large and others are small. Birds, such as the cuckoo and corn crake, which announce their arrival over a comparatively wide area, and whose first appearance is readily detected, should afford tolerably accurate results. Conclusions based on the appearances of such species as the willow wren and chiffchaff will be less correct; and those birds which are generally detected by the eye will furnish results which contain a still larger amount of error. Any circumstance, in fact, whether it be due to the size, the note, or the habits of the species, or to the habits of the observer himself, which tends to diminish the probability of detection and facilitate concealment, lessens the value of the statistics we have been speaking of, and frequently, in my opinion, leads us to imagine that a bird is uncertain in its appearance when in reality it is not. The observer himself is an important element: if he is not situated in a favourable position; if he is here one week and there the next; if he is irregular in his habits; and lastly, if he is not a careful ornithologist, his observations are worse than useless.*

As to the average first appearances, a single example will show how easily we may be misled. Let us compare the spotted flycatcher and the cuckoo: suppose a single specimen of each species to arrive, if it were possible, on the same day during twenty years in a wooded demesne one mile square, the chances I should say are ten to one, perhaps more,—even in the case of a good observer,—but that he detects the cuckoo some days before the flycatcher; and perhaps, if we judge from his twenty years'

* I am increasingly of opinion that these records of arrivals which occupy so large a space in our journals are without any scientific value, and are of interest only to the respective writers.—*Edward Newman*.

observations, the latter bird will apparently have arrived a week later than the former. If the observer is incompetent or lazy, and sits in his parlour until the flycatcher appears opposite the window, I need hardly say the error is vastly increased. This case is only an illustration of many similar ones.

At present I have little more to say on this subject. Perhaps some will consider that I have already made a mountain out of a molehill; it may be so, but such was not my intention. I merely wished to direct attention to a few points which should, I think, qualify some of the conclusions we draw from statistics, showing the arrival of migratory birds: how we should take into account the circumstances which influence the probability of detection—namely, the size, note, and habits of the bird; how we should consider also the habits and competency of the observer, and how careful we should be to select those which are trustworthy and accurate. If these things be allowed for, I am of opinion that birds will be found to migrate with greater regularity than is sometimes supposed, and that the average first appearance of some migrants should be placed at an earlier date than the conclusions founded on observations would lead us to believe was the correct one.

RICHARD M. BARRINGTON.

Fassaroe, Bray, Co. Wicklow,
May 3, 1874.

Ornithological Notes from Devonshire, Cornwall, &c.

By JOHN GATCOMBE, Esq.

(Continued from S. S. 3945).

MARCH, 1874.

2nd. Observed a large flock of herring gulls congregated at their usual breeding-place near the Rhame Head on the Cornish coast, a few miles from Plymouth; they were crying loudly and uttering their peculiar laughing or alarm-notes, as in the nesting season. Remarked also an immature black redstart at the Devil's Point, Stonehouse.

4th. Guillemots and razorbills are now to be obtained in every stage of plumage, from the immature of the year to the perfect breeding-dress.

8th. There were several dabchicks on the Laira to-day. The way in which these birds manage to evade pursuit when hard

pressed is truly wonderful. I have known them, after having tried their utmost for a long time to escape by diving in the open water, to suddenly disappear in a manner the most unaccountable, especially to those unacquainted with their habits; but on repairing to the shore and disturbing the weeds, or anything that may afford the least concealment, with your paddle, you will observe something suddenly dart out from under, just like a flatfish, leaving a line of muddy water in its wake, should it be very shallow, and on keeping your eyes in the direction it took, up will pop the dabchick, perhaps just within gunshot, on the surface; but down it goes again in an instant, before you can take even a "snap-shot." On some occasions I have seen them fly suddenly off from their place of concealment, and on alighting instantly dive. They make use of their wings as well as their legs to propel themselves when under water; and when among the weeds they must continue to sink their bodies, so that only the top of their heads, or perhaps bills alone, would be above, and which of course it would be almost impossible for one to discern among the surrounding objects. I have sometimes observed dabchicks in bays on the sea-coast, especially near the entrance of an estuary or large river.

9th. The weather has suddenly become very cold, with heavy snow storms, but I have observed none of the thrush and lark tribe flying from east to west, as they invariably do during snow storms in the earlier part of the winter.

12th. Took a walk in the country a few miles from Plymouth, and found that all the redwings and almost all the thrushes had disappeared during the snow.

13th. Saw the first wheatear for the season, and some herring gulls in perfect breeding-dress.

14th. There was a beautiful male garganey brought to the bird-stuffer's, killed in a pond near Plymouth, and I saw another in the market: I understand that several others (all males) have been seen and obtained in Cornwall and the north of Devon within the last few days. Lesser blackbacked gulls have now become very plentiful, just as they were last season; before the breeding season they appear to arrive on our coasts in great numbers.

20th. Curlews have been moving about a great deal by night lately.

23rd. There were some golden plovers in the market with nearly perfect black breasts. Saw a very pretty variety of the hedge-

sparrow at a birdstuffer's, in which a part of the head and nearly the whole of the breast was pure white; the other parts were of the usual colour. Varieties of the hedgesparrow are, I think, not common, but I have observed that it is very subject to a kind of wart or excrescence on the eyelids and feet.

APRIL, 1874.

6th. Remarked some gray wagtails with fine black throats. Lesser blackbacked gulls still very numerous in our harbour, and to-day I observed among them one blackheaded gull which had not yet left for its breeding-station: I have never known any of this species to remain in the neighbourhood during the summer.

8th. A wryneck was killed in the vicinity of Plymouth: this bird is very uncommon in our western counties. Several ring ouzels were also seen on Dartmoor.

10th. Heard and saw both the willow wren and blackcap on the Cornish side of the river Tamar.

14th. Up to this time a dealer in live birds living in Plymouth has had no less than nineteen young ravens brought to him from nests taken chiefly on the Cornish coast.

15th. Chiffchaffs very plentiful and in full song, though the weather was very cold, but saw no willow wrens or blackcaps.

17th. Observed, in Bickleigh Vale, longtailed tits singly, and in pairs, but none in flocks; also many pairs of gray wagtails by the river-side. Missel thrushes were very numerous, and singing in all directions: this species is certainly much on the increase. Common wren particularly plentiful in the woods. Heard no blackcaps to-day. Examined a ring ouzel, which had been brought to the birdstuffer's for preservation; its stomach contained nothing but vegetable fibres.

21st. Again visited Bickleigh Vale, where I found jays very numerous; also green woodpeckers, many of which latter had been excavating fresh holes in the trees. Saw many dippers and kingfishers by the river.

25th. Visited Ivybridge, where I saw the common sandpiper by the river, and found wood larks very numerous. I also observed a jackdaw which had a large spot of pure white on each bastard wing. Noticed a dipper, when flying up the stream, to drop suddenly in the water, going completely under, and allowing the current to carry

it many yards down before again making its appearance. This it did on two occasions.

28th. Met with a great number of cuckoos near Launceston, and saw more wood wrens. Observed missel thrushes to-day busily engaged in eating ivy-berries. A gentleman who knows birds pretty well assures me that he saw a splendid pair of adult roseate terns in the Plymouth Sound about a week since, and that they came within gunshot of him: their under parts were very rosy. This species has now become exceedingly rare on our coasts. The lesser blackbacked gulls have not yet left our harbours for their breeding-stations.

JOHN GATCOMBE.

8, Lower Durnford Street, Stonehouse, Plymouth,
April 7, 1874.

Gigantic Squids. By EDWARD NEWMAN.

IN the course of a long paper on the Crystal Palace Aquarium, I ventured for the first time to express a doubt of the value of that hypothesis of Science which denies to Nature the privilege of producing crocodiles, snakes, and squids exceeding in length and bulk those which are stowed away in the vaults of the British Museum; and last year I further risked the publication of a paper by Mr. Pryer giving the exact dimensions of an immense squid he had seen and measured at Yokohama, in Japan, thus endeavouring to remove the embargo from off this branch of scientific research—to throw the trade in observation and discovery open to the world.

Mr. Saville Kent, in a contribution to No. 51 of the 'Popular Science Review,' goes still more thoroughly into the subject, and entirely exonerates the family of squids from that accusation of smallness which had been so lavishly and so unwisely heaped on them by the magnates of science. Beginning with Aristotle, he traces the history of these squids through the pages of Pliny, Ælian, Strabo, Fries, Olaus Magnus, Pontoppidan, Denys de Montfort, Linneus, Pernetty, Molina, Peron, Quoy and Gaimard, Banks and Solander, DeFerussac and d'Orbigny, Steenstrup, Harting, Allmann, Bouyer, Crosse and Fischer. Wisely eliminating the apocryphal, he leaves untouched the reliable; in fact, adduces a mass of evidence which it seems impossible to call in question, and then descends

to details and admeasurements of actual objects still accessible, still inviting the examination both of the critical and the sceptical.

The evidence of the capture of one of these monsters is most circumstantially given in the 'Field' newspaper for January 31st, of the present year, and portions of this, as well as the whole of a second specimen are preserved for the satisfaction of future enquirers. The narrative is given thus:—

"On October 26th, while two fishermen from St. John's were plying their vocation at the eastern end of Great Belle Island, Conception Bay, they descried, at a short distance, a dark shapeless mass floating on the water. Concluding it was a bale of goods, possibly a portion of the cargo of some wrecked vessel, the men rowed up to it, anticipating a valuable prize, and one of them struck the object with his boat-hook. In an instant the dark mass became animated, and opening out like a huge umbrella, displayed to view a pair of prominent ghastly green eyes of enormous size, which glared at them with apparent ferocity, its huge parrot-like beak at the same time opening in a savage and threatening manner. The men were so terrified by the terrible apparition that for a moment they were unable to stir, and before they could recover their presence of mind sufficiently to endeavour to make their escape, the monster, now but a few feet from the boat, shot out from and around it several long arms of corpse-like fleshiness, and, grappling for the boat, sought to envelope it in these livid folds. Two of these reached the craft, and, in consequence of its greater length, one went completely over and beyond it. At this moment one of the men, by name Theophilus Picot, fortunately recovered from his fright, and seizing a hatchet that happened to be on board succeeded by a desperate effort in severing both these arms. On finding itself wounded the animal moved off backwards, at the same time darkening the water with its inky emissions, and presently became lost to sight beneath the surface of the waves. The amputated arms, which were left in the boat as trophies of the terrible encounter, were brought to St. John's, and through the energy of Mr. Harvey, the longer one was secured for the museum."—Page 120.

This so-called "arm," or rather that portion of it which has been preserved, measures nineteen feet in length; it is extremely slender, measuring only three inches and a half in circumference, excepting towards the extremity, where it widens into a spathulate or oar-shaped disk, covered with suckers to the very extremity, which terminates in a "pretty fine point." All naturalists know that the cephalopods have either eight or ten of these so-called "arms," and that they are denominated octopods or decapods according to the number, but it does not seem to be so generally understood that

the divisions of the "foot," as it is called in gasteropod mollusks, are always eight, and that the supplementary pair in certain cephalopods find no homologues whatever in the octopods. These supplementary arms are without doubt those which Theophilus Picot succeeded in amputating.

The fishermen were far too terrified by the encounter to give any reliable estimate of the size of the enemy; they talked of sixty feet in length, but we all know that hasty estimates of the size of a sea serpent or a sea squid cannot be quoted as good Natural History; and therefore we have every reason to congratulate ourselves on a coincidence which has rarely happened in the annals of Science. Scarcely had the first narrative obtained publicity when a second squid, little inferior in size to the first, was taken by three Newfoundland fishermen in a herring-net in Logie Bay, some three miles from St. John's. Its voluminous arms became so completely entangled in the folds of the net that its power of resistance was annihilated. The entire body was taken to St. John's; photographs were made, and means were taken to preserve the body entire. The following dimensions were taken and recorded:—

Length of body	-	-	-	8 feet.
Girth of body	-	-	-	5 „
Length of supplementary tentacles	-	-	-	24 „
Length of the eight shorter arms	-	-	-	6 „

The publication of this account elicited others, and there is now no reasonable doubt that gigantic squids not only exist but almost abound on the coast of Newfoundland; there is no doubt, moreover, that they constitute the principal food of the Odontocete, those toothed whales which form so important a series of endosteate animals.

Mr. Kent has, I venture to think, done unwisely in giving a new generic and specific name to this creature (*Megaloteuthis Harveyi*); we already have more genera and more species than we have specimens, and I cannot but anticipate they will all melt away when placed in the crucible of more exact science. Professor Steenstrup had previously named one of the monsters *Architeuthis Monachus* and another *Architeuthis Dux*. These are described by Professor Verrill in a most interesting contribution to Silliman's 'American Journal' for January last.

So far I had written when I saw the following in the 'Times' of Saturday, July 4th. Whether intended to burlesque and discredit

the American narratives above cited, I cannot say, and have no desire to offer an opinion; but I cannot refrain from observing that the coincidence between all these details and the methodical description of the animal seen by the Rev. John Macrae and the Rev. David Twopeny (Zool. S. S. 3517), and again by Lady Florence Leveson Gower and the Hon. Mrs. Coke (S. S. 3804) is too obvious to escape the most superficial reader, and really bids fair to solve the sea-serpent mystery at last.

“We had left Colombo in the steamer ‘Strathowen,’ had rounded Galle, and were well in the bay, with our course laid for Madras, steaming over a calm and tranquil sea. About an hour before sunset on the 10th of May we saw on our starboard beam, and about two miles off, a small schooner lying becalmed. There was nothing in her appearance or position to excite remark, but as we came up with her I lazily examined her with my binocular, and then noticed between us, but nearer her, a long, low swelling lying on the sea, which from its colour and shape I took to be a bank of sea-weed. As I watched, the mass, hitherto at rest on the quiet sea, was set in motion. It struck the schooner, which visibly reeled, and then righted. Immediately afterwards the masts swayed sideways, and with my glass I could clearly discern the enormous mass and the hull of the schooner coalescing—I can think of no other term. Judging from their exclamations, the other gazers must have witnessed the same appearance. Almost immediately after the collision and coalescence, the schooner’s masts swayed towards us, lower and lower; the vessel was on her beam-ends, lay there a few seconds, and disappeared, the masts righting as she sank, and the main exhibiting a reversed ensign struggling towards its peak. A cry of horror rose from the lookers-on, and, as if by instinct, our ship’s head was at once turned towards the scene, which was now marked by the forms of those battling for life—the sole survivors of the pretty little schooner which only twenty minutes before floated bravely on the smooth sea. As soon as the poor fellows were able to tell their story they astounded us with the assertion that their vessel had been submerged by a gigantic cuttle-fish or calamary, the animal which, in a smaller form, attracts so much attention in the Brighton Aquarium, as the octopus. Each narrator had his version of the story, but in the main all the narratives tallied so remarkably as to leave no doubt of the fact. As soon as he was at leisure, I prevailed on the skipper to give me his written account of the disaster, and I have now much pleasure in sending you a copy of his narrative:—

“‘I was lately the skipper of the ‘Pearl’ schooner, 150 tons, as tight a little craft as ever sailed the seas, with a crew of six men. We were bound from the Mauritius for Rangoon in ballast to return with paddy, and had put in at Galle for water. Three days out we fell becalmed in the bay

(lat. $8^{\circ} 50' N.$, long. $84^{\circ} 5' E.$). On the 10th of May, about 5 P.M.,—eight bells I know had gone,—we sighted a two-masted screw on our port quarter, about five or six miles off; very soon after, as we lay motionless, a great mass rose slowly out of the sea about half a mile off on our larboard side, and remained spread out, as it were, and stationary; it looked like the back of a huge whale, but it sloped less, and was of a brownish colour; even at that distance it seemed much longer than our craft, and it seemed to be basking in the sun. "What's that?" I sung out to the mate. "Blest if I knows; barring its size, colour and shape, it might be a whale," replied Tom Scott; "And it ain't the sea serpent," said one of the crew, "for he's too round for that ere crittur." I went into the cabin for my rifle, and as I was preparing to fire, Bill Darling, a Newfoundlander, came on deck, and, looking at the monster, exclaimed, putting up his hand, "Have a care, master; that ere is a squid, and will capsize us if you hurt him." Smiling at the idea, I let fly and hit him, and with that he shook; there was a great ripple all round him, and he began to move. "Out with all your axes and knives," shouted Bill, "and cut at any part of him that comes aboard; look alive, and Lord help us!" Not aware of the danger, and never having seen or heard of such a monster, I gave no orders, and it was no use touching the helm or ropes to get out of the way. By this time three of the crew, Bill included, had found axes, and one a rusty cutlass, and all were looking over the ship's side at the advancing monster. We could now see a huge oblong mass moving by jerks just under the surface of the water, and an enormous train following; the oblong body was at least half the size of our vessel in length and just as thick; the wake or train might have been one hundred feet long. In the time that I have taken to write this, the brute struck us, and the ship quivered under the thud; in another moment, monstrous arms like trees seized the vessel and she heeled over; in another second the monster was aboard, squeezed in between the two masts, Bill screaming "Slash for your lives;" but all our slashing was of no avail, for the brute, holding on by his arms, slipped his vast body overboard, and pulled the vessel down with him on her beam-ends; we were thrown into the water at once, and just as I went over I caught sight of one of the crew, either Bill or Tom Fielding, squashed up between the masts and one of those awful arms; for a few seconds our ship lay on her beam-ends, then filled and went down; another of the crew must have been sucked down, for you only picked up five; the rest you know. I can't tell who ran up the ensign.—JAMES FLOYD, late master, schooner Pearl."—*'Homeward Mail,' as reprinted in the 'Times' of July 4.*

Report of Committee appointed "To obtain Information respecting the Subject of a Marine Aquarium, with the view of promoting an efficient Institution of the kind in Birmingham."

[The intense interest I have taken in Aquariums ever since they were instituted on a small scale by Messrs. Bowerbank and Warrington, more than forty years ago, must be my excuse for introducing the following "Report" into the pages of the 'Zoologist.' I am aware that copies have been liberally distributed in the locality to which it more particularly refers; both the object contemplated and the subject so ably and instructively treated have a far wider application, and therefore merit a more extended circulation.—*Edward Newman.*]

YOUR Committee has held five meetings, at the first of which Messrs. Hughes, Parsons and Wills were requested to sketch out a draft circular, to be addressed to the promoters and superintendents of existing and projected aquaria, both in England and abroad, with a view of obtaining accurate information as to the cost, management, &c., of such establishments. At their second meeting a circular was approved and ordered to be forwarded to the managers of the following aquaria, *viz.*:—In England: Crystal Palace, Brighton, Dublin, Hastings, Kingstown, Liverpool, London (Zoological Society), Manchester, Ramsgate, Scarborough, and Southport. On the Continent: Berlin, Brussels, Copenhagen, Frankfort, Hamburg, Hanover, Havre, Naples, Paris, Vienna. In America: New York. The enquiries which it embodies are of an exhaustive character, embracing the date and conditions of establishment, amount of capital, present market value of shares, profit realized, attendance of visitors, cost of foundation and maintenance, number and size of tanks, mode of circulating and aerating their contents, state of health of the inhabitants, and many other important particulars. Finally, an opinion was requested as to the possible injury which might result from the impurities which contaminate the atmosphere of a large manufacturing town.

Your Committee regret that they received direct replies to this circular from only two English aquaria, and from the same number of foreign establishments. They have, in addition, obtained information, more or less complete, as to several other projected aquaria in this country, but in most instances it is proposed to

combine with the attractions of the aquarium proper those of so many other subsidiary establishments, such as shops, concert halls, billiard rooms, &c., that it is impossible to regard such information as of any real value for the specific purpose contemplated in this enquiry.

At the third meeting of your Committee, it was resolved that Messrs. Hughes, Parsons, Tonks and Wills should be requested to examine the data which had been obtained, and also to visit the aquaria at the Crystal Palace and at Brighton, and specially to confer with Mr. W. A. Lloyd, whose great experience and unqualified success in the management of the former, and previously of the Hamburg Aquarium, entitle his opinion upon the subject in question to be regarded as of paramount weight and value. The result of their interview with Mr. Lloyd, and of their careful examination of the Crystal Palace and Brighton establishments, together with their analysis of the other information available to your Committee, is set forth in the Report which follows. It remains to be added that your Committee fully endorse the expression which it conveys of sincere gratitude to Mr. Lloyd for the liberal spirit in which he has unreservedly communicated a great mass of valuable information.

Report of Sub-Committee.—In accordance with the instructions of the Committee, we proceeded to the Crystal Palace, where we were most courteously received by Mr. W. A. Lloyd, the Manager of the Crystal Palace Aquarium, who not only gave us special facilities for the examination of the tanks, and drew our attention to the points of special biological interest which their inhabitants present, but also fully explained the mechanical arrangements whereby the circulation and aëration of the water are maintained both in the show and reserve tanks. We desire to record our grateful sense of the great pains which Mr. Lloyd has taken, both personally and by written communications, to put us in possession of much information likely to be valuable in the development of any scheme for the establishment of a local aquarium. From London three of our number went on to Brighton, where they were again very kindly received by Mr. Reeves Smith, the General Manager of the aquarium in that town. We desire in this Report to summarize the information we have obtained from various sources, as well as the results of our own observations, and at the same time to analyze the replies received to the circulars addressed

by order of the Committee, some weeks ago, to the managers of existing and projected aquaria, both at home and abroad, in order to ascertain how far our own conclusions are justified or otherwise by their contents. It appears to us to be convenient to consider the subject under two distinct aspects, *viz.*:—1st, in reference to the biological conditions of success; 2nd, to those which are essential to financial success.

1st. Unfortunately much of the information obtained refers to establishments not yet in active operation. Thus, the Eastern Counties Aquarium Company, Limited (Great Yarmouth), the Liverpool, Manchester, and Southport Aquaria, are all schemes as yet in this position. Among aquaria in actual working order we find two distinct systems in use; the one being illustrated in the practice of Brighton, Berlin, and Vienna; the other in that of Hamburg, the Crystal Palace and the Jardin d'Acclimation in Paris. These two systems are essentially different in principle and in action, and in England are fairly typified in the establishments at Brighton and Sydenham respectively. In the former, there is no actual circulation from one tank to another; the bulk of water in the reserve-cisterns bears only a small proportion to that in the show-tanks, and aëration is accomplished by pumping air into the water through vulcanite tubes of considerable diameter. In the latter, on the contrary, a constant circulation is maintained night and day from one tank to another; the bulk of water in the cisterns is about five times that of the contents of the show-tanks, while aëration is effected by carrying a main over the top of the latter for their entire length, from which, under considerable pressure, a small stream of water pours from a tap into each, breaking the surface of the water, and carrying down into its body countless myriads of air-bubbles, so minute that they float long about the tank before rising to the surface, partaking of the proper motion of its contents, instead of coming almost instantly to the top, as the larger bubbles of air do at Brighton; thus they present an enormous oxidizing surface to the water, and as a result its whole mass has a bright, sparkling, almost effervescent appearance. Unfortunately, in the opinion of many competent persons, the Brighton Aquarium is, zoologically considered, by no means a success: the mortality among the animals is said to be great; the tanks are certainly often turbid; and sooner or later a general reconstruction of the whole establishment will probably be necessary. The Berlin Aquarium

has never been successful, and is now, as we are informed, in a disgraceful state. The Director of the Vienna Aquarium has given a somewhat indefinite reply to our enquiries, which suggests the idea that radical alterations in the system of management are already deemed necessary; and we learn from other sources that its present condition is unsatisfactory. On the other hand, the Hamburg establishment is eminently healthy and successful. As regards that of the Jardin d'Acclimatation, its Director writes that its inhabitants enjoy "une excellente santé," and adds, "L'aquarium a eu grand succès; aujourd'hui il y a lieu de lui donner une grande extension." Finally, we can testify from our own careful examination of the Crystal Palace Aquarium to its eminent success in a biological point of view. The most delicate animals, such as *Cerianthus Lloydii*, groups of Mediterranean corals, large masses of *Sabellæ*, the rare star-fish *Uraster glacialis*, &c., are maintained in conspicuously good health; and the still rarer star-fish *Lluidia fragilissima* renews its lost parts; the fishes, many of them of rare species, are not only in perfect health, but are almost free from those parasitic growths to which they are so subject in confinement; many of the larger specimens consist of the very individuals introduced at the opening of the aquarium; while the water in every tank is beautifully transparent, brilliant, and sparkling. We conclude, therefore, that the system of which these three aquaria are examples, and which is to be also adopted at the projected establishments of Manchester and Southport, is right in principle and effective in practice; while that of which Brighton is a type, is essentially faulty in theory and unsuccessful in practice.

2nd. In reference to the conditions of financial success, we find that, after eliminating from our consideration those establishments the constitution of which clearly renders them useless as examples for our guidance, the data at our command are somewhat meagre, and that we can do little more than lay before the Committee certain broad general principles, confirmed by the experience of the most practiced and successful of aquarian naturalists. Thus we find that the capital invested at Berlin is £65,000; at Vienna, £34,400; at Brighton, nearly £100,000; while the projected Companies of Liverpool, Great Yarmouth, Ramsgate, and Southport propose to raise, respectively, the sums of £60,000, £50,000, £40,000, and £60,000. We are not in possession of data as to the cost of the Manchester Aquarium, inasmuch as the Secretary

declined to afford us any information without being paid for it, a proposition to which we were not disposed to accede; but from the size and elaborate character of the building, it is evident that the capital is large.* Assuming that any proposition for the foundation of an aquarium in Birmingham must be of a much more modest character, we find that the only existing institutions of the kind, the financial bases of which we need examine, are those of Paris, Hamburg and Sydenham, and it is important to observe that these differ essentially from the English establishments which we have mentioned above (except *possibly* that of Manchester) in being truly genuine aquariums, standing or falling on their zoological merits alone, instead of being mere adjuncts to a musical lounge, as at Brighton; or depending for success upon rental of restaurants, croquet-lawns, billiard-rooms, American bowling-alleys, ozone-baths, &c., as at Great Yarmouth and Ramsgate; or upon "an almost daily succession of concerts and light entertainments," and "bijou shops for articles de luxe," which will be, as we learn from the prospectus, sources of revenue at Liverpool. For this reason the analysis of the financial elements of these three aquaria deserves our special attention. We find, then, that the aquarium of the Jardin d'Acclimatation is an integral part of the "Compagnie du Jardin Zoologique;" that the shares (the number of which is unfortunately not stated) are of 250 francs, all paid up; that their present market value is 125 francs, and that no dividend has been paid since its establishment in 1862. The average attendance is 450,000 annually, but the entrance fee to the Jardin d'Acclimatation includes also admission to the Aquarium. The cost of buildings and tanks was 100,000 francs (£4,166), and the tanks are fourteen in number, each containing about one cubic metre. The Hamburg Aquarium was opened in 1864, and had the immense advantage of the early popularity of the recently established gardens in which it is situated; the still greater one of being under the management of Mr. W. A. Lloyd, whose zeal and self-sacrifice reduced the total current expenditure to £600 per annum on a capital of £3000. As a consequence, capital and profits balanced each other in six years. But this was accomplished through a fortunate combination of exceptionally favourable circumstances; for, as Mr. Lloyd himself

* I have since received from Manchester a statement of the exact cost of the aquarium there, namely £11,971: the opening of this institution is described as eminently successful.—*E. N.*

writes, "Our gardens were new, popular and fashionable, and I have known as many as 250,000 (nearly the whole population of Hamburg and its environs) enter these gardens in five or six days. We had as many as 25,000 to 32,000 pass the gates on a fine Sunday or Easter Monday or Whit-Monday, and of course the aquarium gained by this. I have known £80 taken in the aquarium in twelve hours on such a Sunday, and in the autumn of 1864 we took £60 a-week for ten weeks consecutively. But as the whole place had but one-tenth of the population of London, this could not last; hence its great popularity was at first, and hence the smallness of the average takings when spread over six or seven years." Turning, lastly, to Sydenham, we are only able to state, in broad terms, that the cost of the buildings, tanks, machinery, &c., and of stocking, was about £12,000, exclusive of ground; and that a large dividend has resulted from its operations. Mr. Lloyd has expressed his decided opinion that, successful as it is biologically, even this aquarium could not possibly be made to pay apart from the other attractions of the Palace; further, in a letter to Mr. Hughes, full of practical information of the most valuable kind, freely communicated in that spirit of brotherhood which ever characterizes the true enthusiast in Natural History, he lays down the broad general principle, that no aquarium can be made to pay its way, unassisted by other attractions, even in the largest centre of population, unless its cost be limited to £3000 and its annual expenses to £500. The facts which we have endeavoured to summarize seem to support this conclusion, and we venture to suggest, finally, that in carrying out the scheme of an aquarium in Birmingham, the alternatives which the promoters will have first to consider are—

1st. Its establishment on a small scale, success depending solely on its attractions as a scientific and educational institution.

2nd. Its formation on a much larger scale, the addition of other attractions and sources of revenue being then admitted to be necessary for pecuniary success.

In either case it will be important to consider whether the scheme shall be carried out in connection with any existing institution or place of public resort, the attractions of which already suffice to bring together a large number of persons, of whom a certain proportion would pay an extra fee for admission to the aquarium itself.

In conclusion, we should state that we have been unable to obtain any decisive opinion as to the possibly injurious effect of the atmosphere of a large town upon an aquarium situated in its midst. The managers at Southport and Vienna decidedly reply, "No!" and the fact deserves notice that the Liverpool Aquarium is to be built in the very centre of that great town. Finally, Mr. Lloyd's opinion, to which the greatest weight unquestionably attaches, is that no such injurious result need be feared.

Birmingham, April 10, 1874.

Birds in Cambridge Market.—The following is a list of the birds I have met with in the Cambridge Market and game-shops:—Kestrel, shorteared and white owls, capercaillie, black and red grouse, ptarmigan, magpie, kingfisher, stone curlew, peewit; golden, gray and ringed plovers; sanderling, oystercatcher, heron, curlew, blacktailed and bartailed godwits, common and spotted redshanks, dunlin, knot, ruff and reeve, woodcock, common and jack snipe, water rail, moorhen, coot; pinkfooted, whitefronted, bernicle and brent geese; sheldrake, gadwall, pintail, shoveller, pochard, scaup, goldeneye, common and velvet scoters, tufted and longtailed ducks, redbreasted merganser, goosander, redthroated diver; great crested, rednecked, eared and little grebes; lesser blackbacked, common, kittiwake and blackheaded gulls; razorbill and gannet. I have only mentioned those which have come under my own observation, but of course other species may be met with from time to time. On the 13th of June I saw in Mr. Baker's shop at Cambridge a female woodcock which had been picked up on the 9th under the telegraph-wires by the Trumpington Road. It was, although a female, the smallest woodcock that either Mr. Baker or myself ever saw: he did not weigh it before skinning, as it was in the most wretched condition. The state of the plumage on the head showed it had been engaged in incubation, but some time since, as the young feathers were appearing. I think a good many birds come to grief through these wires, as the first intimation I had of the arrival of the cuckoo this year was being shown one which had met with a fate similar to that of the woodcock.—*Julian G. Tuck; Tostock House, near Bury St. Edmunds, Suffolk.*

Ornithological Query.—Will any of your readers kindly help me to a solution of the following problem:—Of two species of sea-fowl, which may in other respects be regarded as identical in habits and exposed to similar risks, the one lays a single egg every season and the other lays two eggs, the young birds breeding in the following season. Determine the relations in respect of duration of life, for the maintenance of a constant ratio

between the numbers of the species.—*S. H. Saxby; East Clevedon, Somerset, June 24, 1874.*

Osprey carrying off Chickens.—Observing Mr. Arthur John Clark-Kennedy's account of an osprey carrying off chickens, in the May number of the 'Zoologist' (S. S. 3996), and as such behaviour is not in accordance with the usual habits of the species, I have pleasure in reminding your readers of a similar occurrence recorded by me in the 'Zoologist' for December, 1868 (S. S. 1484). See also 'Birds of the West of Scotland,' page 20.—*John A. Harvie Brown; Dunipace House, Falkirk, N. B., June 29, 1874.*

Buzzards in Norfolk.—On March 4th, 1874, a good male specimen of the roughlegged buzzard was shot at Burgh, near Yarmouth: it had been resident in that neighbourhood for several weeks previously, feeding chiefly on the fieldfares and lapwings frequenting the surrounding marshes. A female common buzzard was shot at Bergh Apton on the 20th of March: stomach full of rabbit's fur.—*T. E. Gunn; Upper St. Giles Street, Norwich.*

Marsh Harrier in Suffolk.—A male specimen of the marsh harrier was captured on the 8th of May, 1874, in the neighbourhood of Yaxford, in Suffolk.—*Id.*

Food of Barn Owl and Great Spotted Woodpecker.—Many observers assert that the barn owl feeds almost, if not quite, exclusively on mice and young rats: in dissecting an old bird very recently I took from its stomach the remains of a sedge warbler, the head and legs being quite entire and easily distinguishable. I also picked up an almost full-grown water vole, quite dead, that had been dropped by the old bird near its nest. The great spotted woodpecker seems excessively fond of the larva of the goat moth. I know of an old tree close by this city completely bored and riddled by this insect, and which is the favourite resort of a pair of these birds in obtaining food. One of the old birds was unfortunately killed, and when picked up had between its mandibles an immense goat-larva, measuring over three inches and a half in length; it was crushed all over and quite dead. The bird itself smelt very strongly of the peculiar odour; its stomach on dissection was found to be filled with the remains of the larvæ.—*Id.; June, 1874.*

Pied Flycatcher in Norfolk.—A male in adult plumage was obtained on the 15th of May, 1874, at Stalham: stomach full of minute insects.—*Id.*

Lesser Redpoll breeding near Norwich.—A nest of the lesser redpoll, containing two fresh-laid eggs, was taken on the 16th of May, 1874, on Higham Causeway, Norwich: it was built in the branches of an alder-bush. The nest was composed of green moss and fine dry grass, lined inside with fine cow-hair and the down of the cotton-rush and a feather or two. The lesser redpoll is becoming quite a resident in Norfolk: I have noticed its

nesting in several localities during the last few years. I may mention, in addition to the above, the parishes of Surlingham, Bramerton, Great Cressingham, and Hickling.—*T. E. Gunn.*

Yellow Wagtail and Wild Goose near Guildford.—I have observed several yellow wagtails (*Motacilla flava*) by the side of the Wey near Guildford, also on grassy downs, one on the 26th of May, three on the 18th of June, and one since. A flock of wild geese passed over close to this town on the 19th of June, the whole amounting to about fourteen individuals.—*W. Thomas; St. Catharine's, Guildford, June 22, 1874.*

Little Bittern in East Yorkshire.—A fine specimen of the little bittern was shot near Easington, in this Riding, on the 25th of May last. It was unfortunately so shattered by the shot as to render it impossible to examine it internally.—*F. Boyes.*

How the Puffin ascends to its Nest.—Considering its habits, the puffin, in comparison with most birds building on heights, seems somewhat insufficiently provided with the means of getting to its nest. How it contrived during the breeding season to make the frequent ascents necessary whilst feeding its young, was a question to me, until a short visit to Flamborough Head on the 20th of last June explained the process. On the cliffs north of the lighthouse numerous guillemots and puffins were nesting. The latter chose the lower cliffs, and from their boldness their actions were easily watched both from above and below. Their manner of ascending to their nests, which were from fifty to one hundred feet from the sea, was as follows:—The bird rose from the water some way from the shore, flying so as barely to clear the tops of the waves until within fifty yards of the cliffs, when it appeared to depress its tail, which was fully spread, and by extending its webbed feet on either side nearly to double the surface of resistance, its course was changed, and the bird rose without apparent difficulty to its nest. Whilst thus used the legs were laid along the sides, the inner toe of the extended foot was covered by the outer feather of the tail, the points of the toes did not project beyond the curve formed by the tips of the tail-feathers, the combined arrangement of feet and tail thus forming a short but very powerful instrument, broader in proportion than the tail of most birds at that distance from the body. The habit was common to all the puffins which I saw go to their nests, and I think the guillemots used their feet in a similar manner. Whilst rising, the wings were moved with the same regularity as in horizontal flight. It is evident that the use of the tail and feet described must lessen the speed of flight, and the puffin is not eminent for its flying powers. It seemed as if the bird were conscious that it must have plenty of "way" on it at the commencement of the rise, and approached the point at which it began to ascend at a great speed. It occurs to me that the weight of the puffin's body must tell in its favour if, as I surmise, the bird ascends by the momentum gained in its level flight

driving it up an inclined plane of air. If the above explains the peculiar action of the feet described, it may account for the singularly short allowance of tail that many web-footed birds are favoured with.—*H. Marriage Wallis; London, July 11, 1874.*

[**The Guillemots at the Zoological Gardens.**—A similar deficiency, or indeed almost total absence, of tail has often struck me in the guillemots, and it has been with intense pleasure I have watched the actions of these birds, under the care of the very intelligent keeper, Mr. Church, at the Zoological Gardens. We have had at different times several of these birds in the Gardens, but have never succeeded in keeping them any length of time: we have now two, one a bird of 1872, the other a bird of 1873. Both of them are exceedingly tame, and will walk deliberately into a cage constructed in the similitude of a rabbit-hutch in order to be conveyed from their residence in the eastern aviary to the basin in the pelican enclosure, where they are fed on gudgeon and other small fishes, simultaneously conveyed thither by the keeper in a tin can, this fish-can in one hand, the guillemot-hutch in the other. The guillemots are perfectly unmutated; the stumpy tail may perhaps be a little worn, and this is scarcely perceptible; the wings are entire, and there is no obvious reason why the birds do not take leave of their keeper and wing their way to the sea-side in company with other fashionables. Their gait in walking is awkward in the extreme; they waddle along, resting on the whole length of the tarsus, and emit almost incessant guttural sounds, whether indicative of affection for their keeper or eagerness for food I am not prepared to say. As soon as the fishes are transferred from the can to the basin the guillemots plunge in after them, and now a scene of vigour and activity takes place which does one good to watch. You see at a glance that although the guillemot is known to avail himself of land or air when necessity compels, yet water is his element, his home. The first observation you will infallibly make is that the wings, which we are apt to suppose exclusively organs of flight, are now converted into organs of swimming, and are used, to the almost entire exclusion of the legs, for the purpose; the wings, under water, are plied with the strength and regularity of the fins of a turtle, but with infinitely more rapidity and energy; the legs seem to follow the body because they must, not because they wish to; they flap feebly and lazily, but allow the wings to do all the work. The bird must keep a bright look out under water, for he pursues the fish with undeviating accuracy, whatever its speed and however abrupt and angular its turns to avoid him: escape is impossible: the fish is generally seized crosswise of the bill, and brought to the surface of the water to swallow head first. The office of the wings in swimming is not more remarkable than their apparent inaptitude for flight: if taken out of the water and dropped from a height of three or four feet on to its surface, the bird invariably plunges below, and begins to pursue

imaginary gudgeons if there are no living ones to be swallowed. As soon as the exhibition is over the lethargic listless bearing and guttural grumbling of the birds is resumed; it re-enters its hutch with all the sulky obedience of a well-disciplined child, and is forthwith conveyed to its appointed home. Of course, as the feet seemed almost useless in swimming, I wanted to see them utilized in flight in the manner described by Mr. Wallis as regards the puffin, but I had no such gratification.—*Edward Newman.*]

Glaucous Gull.—The Iceland gull described by Mr. Kennedy in the July number of the 'Zoologist' (S. S. 4078) appears to me to be in the transition stage between the plumages of the first and second year. I think I could show him a specimen shot here two winters ago by me in a very similar dress. I obtained three here that winter, and on one day saw upwards of thirty, besides glaucous gulls. They were always much more wary than the glaucous gulls. Papers upon the great arrival of glaucous and Iceland gulls in the winter of 1872-73 in the Firth of Forth and elsewhere on the east coast of Scotland were read at meetings of the Glasgow Natural-History Society by Mr. Robert Gray, late Secretary, and myself. The glaucous gull is a regular winter visitant to our coast, and I shall not be surprised if the Iceland gull be found to be so also.—*John A. Harvie Brown; July 2, 1874.*

Proceedings of Scientific Societies.

LINNEAN SOCIETY OF LONDON.

Anniversary Meeting, May 25, 1874.—G. BUSK, Esq., Vice-President, in the chair.

The Secretary stated that the death of twelve Fellows of the Society (*viz.*—Philip Barnes; Frederic Bird, M.D.; Robert Cole; Henry Deane; J. T. Dickson, M.B.; James Fischer; Rev. Dr. Garnier, Dean of Winchester; Albany Hancock; T. N. R. Morson; J. L. Stewart, M.D.; Thomas Turner; Francis C. Webb, M.D.) and of three Foreign Members (*viz.*—Professor Louis Agassiz; Georg Ritter von Frauenfeld; Carl Friedrich Meissner, M.D.) had been ascertained to have taken place during the year; and twenty-seven had been elected during the past year.

The Chairman announced on the report of the scrutineers appointed for the purpose, that the following gentlemen were elected officers of the Society for the coming year:—President, G. J. Allman, M.D.; Treasurer, Mr. D. Hanbury; Secretaries, Messrs. Frederick Currey and St. George J. Mivart; that Robert Braithwaite, M.D., J. D. Hooker, C.B., M.D., J. G. Jeffreys, LL.D., Mr. Daniel Oliver and Mr. W. W. Saunders were removed from the Council, and the following five gentlemen elected in their place:—Major-

General Strachey, Messrs. W. T. T. Dyer, J. E. Harting, W. P. Hiern, and J. J. Weir.

It was moved by Mr. Busk, seconded by Mr. Carruthers, and carried unanimously:—"That the Secretaries be requested to convey to Mr. Bentham the cordial thanks of the Society for his invaluable services throughout the thirteen years during which he has occupied the President's chair; to express to him the regret with which the Fellows contemplate the loss of his services, and to assure him that the zealous interest which he has taken in the welfare of the Society and the great efforts which he has made, with so much liberality and success, to increase its prosperity and usefulness, will always be held in grateful remembrance."

It was moved by Mr. Busk and unanimously resolved:—"That the thanks of the Society be also given to Mr. Stainton on his retirement from the office of Secretary, with an expression of the Society's deep regret on losing his valuable services in that capacity."

June 4, 1874.—G. J. ALLMAN, M.D., President, in the chair.

The President exhibited a number of living specimens of firefly (*Luciola italica*) recently taken by himself in the neighbourhood of Turin, calling attention to the remarkable synchronous emission of flashes of light by numerous individuals, and pointing out that the phosphorescence is a phenomenon not of darkness merely, but of twilight or night.

Dr. W. G. Farlow exhibited and described microscopical preparations made in the botanical laboratory of the University of Strasburg, illustrating a remarkable asexual development from the prothallus of *Pteris serrulata*. In the centre of the cushion or thickest part of the prothallus were a number of scalariform ducts, the prothallus bearing a number of antheridia, but no archegonia. From these ducts a leaf is developed directly, after which a root is also developed, and last of all a stem-bud. A comparison was drawn between this growth, which was observed in this species only, and the buds indirectly produced from the protonema of a moss. Normally the prothallus of a fern is entirely destitute of vascular tissue of any kind.

The following among other papers were read:—"On the Restiaceæ of Thunberg's Herbarium," by M. T. Masters, M.D.; "On *Napoleona*, *Omphalocarpum*, and *Asteranthos*," by Mr. J. Miers.

June 18, 1874.—G. J. ALLMAN, M.D., President, in the chair.

E. Birchall, Esq., James Leathem, M.D., and J. Harbord Lewis, Esq., were elected Fellows.

Mr. D. Hanbury exhibited branches of olive grown in the open air at Clapham, some bearing flowers, others nearly ripe fruit; also a specimen of *Rheum officinale*, *Baill.*, now grown in this country for the first time, the

source of the true medicinal Turkey rhubarb, and pointed out the characters in which it differs from other species of the genus.

Dr. Hooker made a communication on the subject of some Indian *Garcinias*.

Prof. Thiselton Dyer exhibited a young oak-plant with three cotyledons, which had been sent to him by Mr. Cross, of Chester; also a pitcher-like development of a leaf of the common cabbage, from Harting, Sussex, sent by Mr. H. C. Watson to the Kew Museum.

Mr. A. W. Bennett exhibited drawings of the style, stigma and pollen-grain of *Pringlea antiscorbutica*, *Hook. f.*, describing the remarkable manner in which the pollen of *Pringlea* differs from that of other nearly allied Crucifers, being much smaller and perfectly spherical, instead of elliptical with three furrows. This he considered a striking confirmation of Dr. Hooker's suggestion that we have here a wind-fertilized species of a family ordinarily fertilized by insects, an hypothesis which is again confirmed by the total absence of hairs on the style of *Pringlea*.

An extract was read of a letter from Mr. Harry Bolus to Dr. Hooker, dated Graaft Reinnet, April 4th, 1874, in which he comments adversely on some of the reasonings contained in Grisebach's 'Vegetation der Erde' in favour of the theory of "independent centres of creation." Grisebach, relying chiefly on an observation of Burchell's, makes the Orange River the boundary between the Cape and Kalahari provinces, a boundary which Mr. Bolus shows to be untenable, at least in certain portions. Grisebach unites the Kanoo flora with that of the Cape province; while Mr. Bolus doubts whether it does not differ more from this than from the Kalahari. The Roggeveld, and indeed the whole Kanoo, by its predominance of shrubby Compositæ, seems to incline more to the desert type of plants than to the richer Cape flora.

The following papers were then read, *viz.*:—"On the Resemblances between the Bones of Typical Living Reptiles and the Bones of other Animals," by Mr. Harry G. Seeley; "On the Auxemmeæ, a new Tribe of Cordiaceæ," by Mr. J. Miers; "A Revision of the Suborder Mimoseæ," by G. Bentham, LL.D.; "On some Fungi collected by Dr. S. Kurz in Yornah, Pegu," by Mr. F. Currey; "Notes on the Letters from Danish and Norwegian Naturalists contained in the Linnean Correspondence," by Prof. J. C. Schiödte, of Copenhagen.

ZOOLOGICAL SOCIETY OF LONDON.

June 2, 1874.—ARTHUR GROTE, Esq., F.Z.S., in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the month of May, 1874, amongst which were

specially noticed a blue-faced green Amazon parrot (*Chrysotis Bouqueti*), a young male Koodoo antelope (*Tragelaphus strepsiceros*), and a racoon-like dog (*Nyctereutes procynides*), acquired by purchase; two Pacific whimbrels (*Numenius femoralis*?) from Quiros Island, Pacific, presented by the Rev. S. J. Whitmee; a Beisa antelope (*Oryx beisa*), presented by Admiral Cumming, and a guilding's amazon (*Chrysotis guildingi*), transmitted by Mr. G. H. Hawtayne, from St. Vincent, W.I.

A letter was read from Mr. T. D. Forsyth, containing an account of some of the animals met with in the vicinity of Kashgar.

An extract was read from a letter received from Mr. E. P. Ramsay, relating to a living cassowary (*Casuarus australis*), which he was proposing to send to the Society's collection.

Professor Owen read the fifth part of his series of memoirs on the "Osteology of the Marsupialia." This portion contained a general account of the osseous structure of the Kangaroos.

Lieut.-Col. H. Irby exhibited specimens of apparently a new species of raven, which he had lately obtained in the vicinity of Tangier, Morocco, and which he was intending to describe under the name of *Corvus tingitanus*.

A communication was read from the Rev. O. Pickard Cambridge on some new species of the Arachnidean family of Drassides, from various localities.

A communication was read from Dr. E. Grube, containing descriptions of new Annulata, collected by Mr. E. W. H. Holdsworth on the coasts of Ceylon.

A communication was read from Mr. W. Nation on the habits of *Spermophila simplex*, as observed in the vicinity of Lima.

A communication was read from Mr. A. G. Butler, containing a list of the butterflies of Costa Rica, with descriptions of new species.

June 16, 1874.—Dr. A. GÜNTHER, F.L.S., Vice-President, in the chair.

An extract was read from a letter received from Dr. A. B. Meyer, concerning two birds (*Rectes Bennetti* and *Campephaga aurulenta*) lately described in the Society's 'Proceedings' by Mr. Sclater.

A letter was read from Mr. W. Summerhayes, relating to certain species of curassows found in Venezuela.

Dr. J. Murie read a paper on the nature of the sacs vomited by the hornbills, which he stated, in confirmation of Professor Flower's account of these objects, to consist of the epithelial lining of the stomach.

Mr. W. Saville Kent communicated a second paper upon the gigantic cephalopods recently encountered off Newfoundland. From further information received, Mr. Saville Kent apprehended that it would be necessary to refer the two individuals preserved in St. John's Museum to the genus

Ommatostrephes, thus avoiding the institution of a new genus for their reception, as proposed in his former paper.

Mr. A. H. Garrod read a paper on the "showing off" of the Australian bustard (*Eupodotis australis*), and pointed out the peculiar structure by which this "showing off" was accomplished.

A communication was read from Dr. F. Stolicza, containing a description of the *Ovis Polii* of Blyth, of which he had lately obtained specimens in Yarkand.

Mr. R. Bowdler Sharpe read a paper on a new genus and species of Passerine birds from the West Indies, which he proposed to name *Phœnicomanes Iora*.

A communication was read from the Rev. O. P. Cambridge, containing descriptions of some new species of spiders of the genus *Erigone* from North America.

Dr. Günther read a paper describing some new species of reptiles from the Camaroon Mountains, West Africa. Amongst these were two new species of chameleon, and a new snake of the family of *Lycodontidæ*, proposed to be called *Bothrolycus ater*. One of these chameleons was referred to a new subgenus (*Rhampholeon*) being remarkable for its abbreviated tail and the development of a denticle at the inner base of each claw.

Mr. Selater read a paper containing a description of three new species of the genus *Synallaxis* from M. Jelski's collections in Central Peru, which he proposed to call *S. pudibunda*, *S. graminicola* and *S. virgata*.

Messrs. H. P. Blackmore and E. R. Alston communicated a joint paper on the *Arvicolidæ* which have hitherto been found in a fossil state.

Professor Newton read an account of a living dodo shipped for England in the year 1628, extracted from letters in possession of Dr. J. B. Wilmot, of Tonbridge Wells.

Mr. J. E. Harting read a paper on the common lapwing of Chili, which he proposed to separate from *Vanellus cayanensus*, under the name of *V. occidentalis*.

A second paper read by Mr. Harting contained an account of the eggs of some new or little-known *Limicolæ*.

A communication was read from Mr. R. Swinhoe, containing an account of a new Cervine form discovered in the mountains near Ningpo, China, by Mr. A. Michie, and proposed to be called *Lophotragus michianus*.

Dr. J. Murie read a paper on the structure of the skeleton of *Fregilupus varius*, based on a specimen in the Museum of Cambridge.

This meeting closes the present session. There will be no more scientific meetings until November next.

Notes on British Bats. By WILLIAM BORRER, Esq.

ALTHOUGH I have nothing to say very worthy of record respecting the British bats, such notes as I have from time to time made I with pleasure place at your disposal, and I will commence with—

Vespertilio Noctula.—Well denominated by the immortal Gilbert White “*Altivolans*,” for I have never seen any other species so truly swift-like and ethereal in its flight as this. Its habits have been already so well described that I shall make but few remarks on it. It seems to be very generally diffused throughout the South of England. Bell, quoting White, says he has never seen it till the end of April nor later than July. At Henfield, in Sussex, I shot one on the 26th of September, 1841. It was a damp warm evening, and it was flying very low. It was very fat, and when skinned the body looked like a lump of bacon. It had probably been tempted by the warmth to come forth from its intended winter quarters. I have this note:—On the 3rd of November, 1862, I observed three large bats, flying round my house at Cowfold, Sussex, at 5 P.M. One I shot, and it proved, as I expected from its flight, to be a Noctule. I have frequently seen this bat flying late in October. A few years since (but I made no note of it) I was surprised to hear a great squeaking of bats behind an old door, which had been closed up, on the south side of Cowfold Church. As a rule, I do not think the species mix much together in their places of resort or hibernation; and I conclude that these were Noctules, as one of this species had forced his muzzle into a little round hole, which no doubt formerly contained a handle, much probably to the discomfort of his companions, as they must have been half-roasted, the door being so heated by the sun that it was unpleasantly warm to the hand: “*Hinc illæ lachrymæ*.”

Vespertilio Lesleri I have never seen, nor *V. discolor*.

Vespertilio pipistrellus.—Of *V. pipistrellus* I have nothing to mention except that, many years since, I took several specimens at Ensbury, in Dorsetshire, of a very rusty red colour, nearly that of the dormouse; but I could see no reason to think them any other than *Pipistrellus*.

Vespertilio pygmaeus.—I believe the only British specimen is in the British Museum.

Vespertilio serotinus.—The first specimen I ever saw was taken at Bonchurch, Isle of Wight, and was sent me by my friend the Rev. C. A. Bury. On the evening of the 10th of July, 1851, whilst walking in a lane at Charlton, near Dover, I saw a bat which I at once knew from its flight was of a species I never before saw alive. The next evening I shot a male of this species, and the night after, at the same place, a female; and on the 21st, near Riverchurch, in the same neighbourhood, another male, and I this night saw several others of this species. They commenced their flight about a quarter before nine, and at first they flew very low, hovering occasionally to catch something from the ends of the branches of the trees, in which act I shot the first. As the night got on they flew higher, and between 9.30 and 9.45 they flew altogether out of gun-shot in height. On the 3rd of August I received from Mr. Gordon, of the Dover Museum, a half-grown one, taken from a hole in a tree near Waldershare, Dover; and in October, 1851, I received from the aforesaid Mr. Gordon fifteen specimens alive, male and female: of these I turned ten into the roof of my house at Cowfold, Sussex, and saw them careering round the house many evenings after. They generally flew very high, their flight and manner on the wing much resembling those of the swift, especially in the habit of occasionally turning half over, with their wings extended and motionless. In April, 1852, three or four only appeared, and these I saw most evenings, till, in July, I left home for a month, and I saw no more of them till the 31st of October, when a pair were again flying about my house. This species seems to be especially savage when handled, and will bite most severely if they have a chance. I could not make them take any food in confinement. These were all taken from the old clock-tower at Waldershare, the seat of the Earl of Guildford. After the last-mentioned date I saw them no more at Cowfold; but in June, 1870 or 1871 (for I have no note) I found that they had become common at Henfield, five miles south of Cowfold, where they appear to have remained ever since, probably inhabiting the church, as they are generally flying about some old trees in a meadow near. As I studied bats for many years at Henfield, and was a close observer, I feel certain that the Serotine was not there thirty years ago, and I cannot avoid the conclusion that they are my bats migrated in a body from Cowfold.

Vespertilio murinus I have never met with, nor with *V. Bechsteinii*.

Vespertilio Nattereri.—On the 29th of June, 1848, in taking off the ridge-tiles of a roof in this parish, about a dozen bats were found, only one of which was captured, a male specimen of this species, and on the 8th of July another male at the same place. On the 4th of December I received another, also a male, from the roof of Cowfold Church. I have received specimens from Henfield and from London, and I took one myself from a hollow in a beech tree, in St. Leonard's Forest, in the parish of Lower Beeding, Sussex. Of its habits and flight I know nothing. I have also received this species from Ensbury, Dorset, and from Bonchurch, Isle of Wight.

Vespertilio emarginatus.—Of *V. emarginatus* I can only say that the nearest to it which I have seen is the specimen now in the British Museum, which was taken by Mr. G. Buckton at the Charlton paper-mills near Canterbury, by means of a piece of white paper at the end of a fishing-rod, and is now, I believe, called *V. dasycneme*. See 'Journal of Linnean Society, 1853,' and 'Zoologist' for 1854 (Zool. 4357).

Vespertilio Daubentonii.—One evening, in July, 1849, I strolled into the churchyard of Christchurch, Hants, and my attention was called to a great squeaking of bats, of which I saw a continuous stream issuing from an aperture in the north wall of the church; they all appeared to be making towards the river: both their note and their flight were new to me. The next day I called on the verger, and got him to show me into a chamber in the church with which this aperture communicated: there, clinging to the ceiling and the walls, I saw many hundreds of this species. The floor, too, had many large heaps of their excrement, which I advised the aforesaid verger to experimentalize on in his garden: in some places these heaps were quite knee-deep. The bats were clinging together in great masses; I stirred them up with a long stick, and many took to flight. I had, however, great difficulty in capturing them with a butterfly-net, but the place being very warm I took off my coat, and, standing quite still, was rather surprised, as well as pleased, to find that many settled on my *white* shirt-sleeves, and I easily took as many specimens as I required. On several evenings after, I saw numbers flitting, much in the manner of sand martins, over the surface of the river near the bridge in the town, never appearing to rise very high in the air, and seldom flying much beyond the river-banks. One of those I obtained in the

church had a young one clinging to the nipple, which in no way appeared to impede the flight of its parent. On the 3rd of April, 1856, I obtained this species from the Isle of Purbeck, and in July, 1863, from Ulswater, where, as I am informed by a friend, as well as at Grasmere, they do not fly till late at night over the lakes, but in the boat-houses, &c., they fly by day. I have also seen specimens taken at Preston, near Brighton, a locality in which I should not have expected them, as they appear to be especially addicted to water, and there is none there.

Vespertilio mystacinus.—On the 5th of November, 1848, an adult male was brought me by a servant, who found it suspended by the thumbs, and not by the hinder feet, from a crack in the ceiling of my coal-cellar, here at Cowfold. This cellar is slightly below the surface of the surrounding garden; and in the following June I picked up one dead in the same garden. Early in January, 1853, I received an immature male shot near Dover—singularly late for it to be abroad, but the weather was remarkably mild, there having as yet been no real frost, and the thermometer rarely below 40° at night and from 48° to 50° by day. In August, 1859, a young male was sent me, taken in an ivy-covered wall near Wimborne, Dorset. One day, late in June, 1845, one of these bats was sent me which had flown against a man's *white* frock in the day time at Lindfield, Sussex: it had probably been disturbed by the pulling down of some buildings near: *white* seems particularly attractive to bats.

Plecotus auritus.—Of this bat, which seems to be the most generally diffused, I will only mention that I have seen *two* snow-white specimens, one of which is in the possession of Mr. F. Bond and the other in my own. The latter was taken at Horsham, Sussex, in May, 1872, curiously enough, on the same premises as Mr. Bond's. I have never seen white specimens of any other British species. *P. brevipennis* of Professor Bell appears to be only the immature *Auritus*, which Mr. Bell told me he was satisfied was the case.

Barbastellus Daubentonii.—Of this I can only say that I have on several occasions taken it from under the thatch of summer-houses in Henfield, Sussex, and on two occasions I have taken specimens which had flown into a house at night in the same village of Henfield. I have also received it from Hornsey, Middlesex; and one was taken in a house at Ensbury, Dorset, in

September, 1851. I have also received it from South Weston, near Tetsworth, Oxfordshire.

Rhinolophus Ferrum-equinum.—This species is found about Portsmouth, whence I have received it, and from Bonchurch, Isle of Wight. In 1842 I saw it in abundance at Canterbury, flying from eight in the evening till too dark to see: their flight was heavy and low. I saw it both about the cathedral and around the trees near the donjon, whence I obtained a male and female. The fur is very much deeper and thicker in winter than in summer.

Rhinolophus Hipposideros.—I have never been able to obtain more than one specimen of this little animal, and that is from Kent's Cavern, Torquay, where, in March, 1873, I searched for it in vain, and the men told me they had not seen it or any other kind of bat for some time. A birdstuffer at Torquay told me he had received specimens from a cavern in the cliff near Paignton, in the same neighbourhood.

WILLIAM BORRER.

Cowfold, May 9, 1874.

The Common Gull (Larus canus) in Captivity.

By W. SIDNEY RANDALL, Esq.

EVERY ONE is more or less familiar with the appearance of the sea-gulls, a noisy tribe of beautiful form and colour, infesting our shores, and sometimes also coming inland. Of their habits and peculiarities, however, little information can be obtained, owing to the nature of the localities where they build. Fortunately, they are easily domesticated, and with proper care and attention will often live for many years. They are little or no trouble to keep, eating, as they do, almost any animal or vegetable matter, and apparently thriving as well inland as by the sea. In disposition they seem to be quiet and peaceable, except when irritated.

Peter, as my bird is called (and well he knows his name) was brought from the Scilly Isles to Falmouth, in June, 1873, where he remained about two months before his removal to Staffordshire, where he is at present; so that he is a year and two months old. At first he was rather hard to feed, as he would take nothing but fresh fish, which could not always be provided for him, even at the sea-side; coming inland, it was impossible sometimes to get fish at

all, so for some days his life was despaired of, as he rejected almost everything that was offered to him, only eating a few scraps of raw meat, until I thought of trying slugs. These he took to at once, and for some time subsisted on nothing else, there being fortunately no difficulty in obtaining a supply of both slugs and snails. Nothing will induce him now to swallow a slug, or even look at it. In his feeding is displayed one of his chief peculiarities. He always washes or wets his food, whatever it may be, before deglutition. At first I gave the bird credit for being very clean and particular, especially as the snails, which he took great pains to wash, were mostly covered with dirt and particles of earth. But from observations made lately, and from various works that I have consulted on the subject, I am now inclined to think that this washing is an absolute necessity, without which deglutition would be almost impossible, at least with some of the *Laridæ*.

A short time ago a dead chicken was given to Peter, which he carried off to his water and wetted well, and this before he even attempted to swallow it. A few days after he picked up a couple of young rats that had been killed in a trap, and took them one by one to the water, and then, after his usual process, easily disposed of them. Now Mr. Yarrell, speaking of a gull in his possession, says, "The first time a bird was given to him, after some ineffectual efforts to swallow it, he paused a moment, and then, as if suddenly recollecting himself, he ran off full speed to a pan of water, shook the bird about in it until well soaked, and immediately gulped it down without further trouble." Now here is an interesting example of instinct in two birds, acting differently under similar circumstances. The instinct of Mr. Yarrell's bird remedied a failure, which the instinct of my bird avoided. In both cases, however, the washing seems to have been necessary; but that it is not always so, the following anecdote, given by Mr. G. Donaldson, in the '*Naturalist*,' seems to show:—"A gull I had, used to kill four or five sparrows a day: to accomplish this it got on the best terms with some pigeons, and mixed with them while eating; then stooping, so as to assume the appearance of a pigeon, it set at a sparrow as a pointer would do at his game, then in a moment had his prey by the back and swallowed it."

Mr. Yarrell also mentions a gull that killed and devoured two clutches of young ducks, but he makes no mention of the bird washing them. From this it appears that a gull can sometimes

swallow its prey without previously soaking it, and curiously enough only two days ago I had a proof of this. Three mice killed in a trap were taken out to Peter; in his eagerness he seized the first and gulped it down just as it was; the second and third, however, he not only wet before swallowing, but wet more thoroughly than usual. This shows that in some way the deglutition of the dry mouse was either difficult to accomplish or irritating to the gull's throat.

Space will not allow me to say much more about the habits and peculiarities of this interesting bird; but the following facts are worthy of mention. By no means sociable, but rather inclined to lead a solitary life, he has chosen a very strange companion—a large retriever; the two are excellent friends, the dog permitting the gull to lie down between his fore paws, pull his tail or his hair, and even steal his dinner from his plate, a liberty that none of the poultry dare take. Morris gives an instance of a similar friendship between a gull and a terrier. Yarrell also mentions a gull that made great friends with a pair of silver pheasants; but the most interesting anecdote on this subject is the one already quoted from the 'Naturalist.'

Before concluding I may mention another peculiar fancy that Peter has lately acquired—a fancy for sitting on anything raised from the ground, such as a mound of earth or heap of stones; consequently a little pillar of bricks has been put up for him in one corner of the yard where he is put at night; on it he takes his rest every night, and there we will leave him.

W. SIDNEY RANDALL.

Handsworth Rectory, August 10, 1874.

Ornithological Notes from North Devon.

By GERVASE F. MATHEW, Esq., R.N., F.L.S.

MAY, 1874.

Swift.—May 14. Observed numbers to-day, while travelling between Plymouth and Instow.

Robin.—May 14. Saw several young birds quite strong on the wing, and evidently, from their appearance, at least a fortnight or three weeks from the nest. It was quite a treat to see these familiar and homely little birds after a long absence from England.

Whimbrel.—May 15. I noticed several flocks yesterday feeding on the salt marshes between Barnstaple and Instow, and this afternoon there was a single bird feeding in the middle of our cricket-field at Instow. It was quite tame, and allowed my father and myself to approach within an easy shot before it flew away. I cannot imagine what it was feeding on in such a place, unless it was clever enough to catch the active little sun-beetles (*Amaræ*), which were running about in some numbers over the smooth turf. When we returned, half an hour afterwards, the bird was again in the same place, so it seemed to be a favourite feeding-ground. These birds are evidently perfectly aware of the new Act, for they are much tamer now than they used to be in former years, and may often be seen feeding close below our sea-wall while people are constantly passing above them. My father tells me that a few days since he observed three or four, within ten yards of the wall, busily engaged probing the soft ooze, and that he clapped his hands several times before they flew away.

Common Sandpiper.—May 15. Saw one of these birds to-day on the beach near the cricket-field, and my father tells me that he has on several occasions lately seen a pair feeding by the edge of a brackish pool near this spot. I can scarcely believe, however, that they are breeding anywhere close at hand, as, so far as I know, in this county they always nest by the margin of some fresh-water stream, generally on or near the moors.

Wheatears.—May 18. These birds appear to be remarkably scarce in their old favourite haunts,—Instow and Northam sand-hills,—for I have not seen more than a dozen during the past week. They may, however, be breeding among the stone walls which enclose many of the neighbouring fields.

Cuckoo.—May 18. A friend of mine has just informed me that he heard one of these birds in full cry between twelve and one o'clock this morning. He got out of bed and opened the window. There was a clear sky and the stars were shining brightly, but still it was tolerably dark, as there was no moon. Why should not birds suffer from indigestion and have troubled dreams, which make them, seemingly to us, cry in an unnatural manner and at an unusual time? Dogs, as every one knows, constantly dream and bark and growl during sleep.

Dunlin.—May 18. Saw a pair of these birds, in full summer plumage, feeding by the edge of a muddy pool on Northam Burrows.

Rooks.—May 18. This afternoon, while walking across the grassy plain contiguous to Northam sand-hills, I noticed a number of rooks busily feeding, and as I approached they all flew away with the exception of four. These were squatted on the ground with their heads thrust out in front of them, and I fancied at first they were dead, but on nearing them they one by one exhibited signs of life, raised themselves on their legs, stretched their wings over their backs, and flew off. The last bird, however, before rising permitted me to walk within a couple of yards of it, and I was then able to observe that its eyes were closed, and that it was evidently fast asleep or basking in the warm rays of the sun.

Burrow Duck.—May 18. In the grassy plain above mentioned there is a large shallow pool, and as I was passing at some distance I saw four ducks swimming about, and at first paid but little attention to them, fancying they were domestic birds from a neighbouring farm. However, when I again looked at them, there was something about them which struck me as being queer, for they seemed to be all of the same plumage, a circumstance which would have been somewhat unusual had they been tame ducks. I accordingly turned and walked towards them, and on getting within a couple of hundred yards discovered they were magnificent old burrow ducks. They looked superb with the bright sun shining on their striking plumage, and as I approached nearer they began to show signs of uneasiness, as they swam close together and repeatedly raised themselves in the water, at the same time thrusting their necks forwards and upwards to their full extent, and snapping their bright red bills. (This habit among ducks is, I believe, a sign of anger.) They allowed me to walk right up to the water's edge, and were then not more than thirty yards from me. I clapped my hands, and three of them rose and flew off, exhibiting their beautiful plumage to great advantage. The fourth bird refused to move, and paid no attention to my shouting or clapping. From their size and general appearance these were evidently all males, and their mates were probably breeding among the sand-hills on Braunton Burrows.

Whimbrel.—May 19. Many flocks of these birds were observed to-day, flying about in an excited manner and continually calling to each other. From this I fancy they are just about to leave for their breeding-grounds.

Dunlin.—May 19. Saw a flock of about twenty on the "black

rocks." They were very tame, and did not rise till my father nearly trod on them.

Curlew.—May 19. A few about, but they are probably stragglers from the moors, where they must now be breeding.

Oystercatcher.—May 23. Saw four to-day feeding on the "black rocks." These birds are nearly always to be seen at any time of the year in this locality, so I conclude some very old or barren individuals remain here throughout the summer, while the chief body migrate to their breeding-grounds, though it is possible a few may breed at no great distance from this place.

Greenshank.—May 23. One of these birds flew over my head to-day, uttering its peculiar cry.

Arctic Terns.—May 23. A number of these birds have been observed every day for the past week. They come in with the flood-tide, following the sand-eels, or "brit," as the fishermen call them, and we often see them plunge into the water right in front of our windows. When the tide begins to flow they pursue the little fish up the Torridge for a short distance above Instow, and on reaching a certain point they all suddenly wheel round and return in a closely-packed flock to the confluence of the Taw and Torridge, where they turn again and commence fishing up the latter river, and this manœuvre they repeat again and again. Yesterday morning, while my father and I were fishing for bass, many of these pretty and fearless birds came so close to our boat that we thought at times they contemplated making a dash at the white flies we were using.

Herring Gull.—May 23. This afternoon, while in a boat on the river, I noticed one of these gulls fishing in a manner I never remember having seen one adopt before. It flew close above the surface, and every now and then threw itself into the water, and appeared to try and scoop up the small fish which the bass, who were "playing" near, had no doubt frightened to the surface. This it repeated for at least a dozen times. I have seen boobies and pelicans fishing in a somewhat similar manner, but never a gull.

Merganser.—May 26. This morning, while bass fishing at the confluence of the Taw and Torridge, one of these birds flew close to our boat. It was in fine plumage, and appeared to be a female. The fishermen in this neighbourhood call this bird the "spike-billed wigeon."

Gulls.—May 27. Noticed many this morning feeding on mussels on the "crow," which they pick up, fly aloft with, and drop on the sharp stones below.

GERVASE F. MATHEW.

On Recent Changes in the Fauna of New Zealand.

By THOMAS H. POTTS, F.L.S.

[The following paper, kindly transmitted by Dr. Potts, was read before the Philosophical Institute of Canterbury, New Zealand, on the 12th of December, 1872; subsequently it was printed in the 'Field' newspaper, and lastly in a separate form at Christchurch, New Zealand. Hitherto it has not appeared in a purely zoological journal like the 'Zoologist,' and I am sure it will be read with much interest.—*Edward Newman.*]

IN all observations on the *feræ naturæ* of New Zealand an important fact constantly presents itself, namely, that in a comparatively short space of time a marked change has been effected in the fauna through the agency of civilization. In a great measure this has been brought about by the increasing destruction of many native species, which are now, in consequence, fast dying out. At the same time, if, through the indifference of an increasing population or a mistaken zeal in enriching museums, many peculiar and interesting forms are becoming extinct, the introduction of foreign birds by private individuals and acclimatisation societies has added several new species to the New Zealand fauna, which it may be hoped are of sufficient value to render their importation a benefit to the country.

The introduction of foreign birds is attended not only with expense, but with considerable difficulty, and many attempts have failed, simply from the length of the voyage and want of proper care and attention on board ship. Yet, notwithstanding these drawbacks, several successful importations have gradually produced effect, and the imported species have multiplied so rapidly that the character of the avifauna in parts has been considerably affected thereby. In the North Island the common pheasant and Californian quail have increased wonderfully, and are still spreading over a large extent of country; and it is satisfactory to find that the Maoris, instead of destroying, encourage and protect these new

comers. Starlings, sparrows and finches have in many parts established themselves about the cultivated districts and homesteads; while in the province of Nelson, especially, acclimatisation has been in many cases most successful. There the sky lark, which in point of song generally ranks next to the nightingale, is becoming quite common; for miles along the road from Nelson to Christchurch it soars and sings as in England. Upon the well-known sheep-walks of the Cheviot Hills many imported birds may be noticed,—amongst others the partridge, blackbird and thrush. Although in most other districts nothing of a satisfactory nature can be reported of the reproduction of the blackbird and thrush, notwithstanding the large number turned out, an instance may be cited to show how well other imported species have thriven and increased. In October, 1863, a pair of greenfinches were liberated, which had been purchased by auction for five guineas. The sole occupant of their first nest was one callow nestling; but before the warm days of summer had quite passed away a second family of five was reared, and in the succeeding winter a flock of eight was seen daily. In the following year, late in autumn, more than twenty were flushed from a little patch of chickweed, and since then they have spread so far and wide that the greenfinch's note is now a well-known sound. The musical whoop of the black swan is sometimes heard as the wedge-shaped flock passes over. This grand addition to our list of birds was introduced to clear the Avon from the pest of water-cress, which in a few years had grown into such thick masses as to impede the stream. No doubt they cleared a wider pathway for the current, and for a while seemed happy and contented; but gradually they stole away to find more secluded quarters, and were only heard of now and then as appearing on distant lakes and tarns. Less than twenty pairs were liberated by the Christchurch municipality, and yet they are now represented by many hundreds, as many as five hundred having been counted within a very small area on the Halswell. In Otago, Marlborough and Nelson they are to be met with in many localities in goodly numbers, for they occupy lakes, rivers and standing pools quite regardless of provincial boundaries.

In the towns of Kaiapoi and Christchurch flocks of pert sparrows are as busy on the roads as in any English village; the change of climate has not abashed the impudent cock sparrow, nor weakened the hereditary attachment of the species for man's society. Pledges of this friendship are sometimes discovered in wet weather by

finding gutters or water-spouts choked up by their warm but untidy nests: the blue gum tree (*Eucalyptus*) affords plenty of shelter, and is found to be a favourite nesting-place. The "pink-pink" of the spruce chaffinch is now constantly heard about our gardens; to these also does the hedgesparrow flit, to hide away her blue-green eggs. How many pleasant memories of home are recalled by the cawing of rooks—the old familiar sounds that woke into drowsy life the vicarage elms and the long avenue that led to the squire's hall!

In Otago, where the introduction of small birds has been managed with much forethought and care, acclimatisation has been very successful: in all probability the southern portion of the Middle Island will rival the northern part of New Zealand in the number of its game birds.

It may be readily seen how our bird system is affected by importations, but we have no clue to the extent of the changes which the next few years may present. The various species which have been mentioned may be now fairly considered as established, and although the list might have been swelled with the names of many other birds which are supposed to be thriving because they have been turned out or have escaped, we cannot speak of them with such certainty. This country offers such a field for the work of acclimatisation that it has ever appeared to us a subject for regret that efforts of this character are not undertaken on some general plan for the whole country; we might then perhaps have some guarantee that the species imported are worth turning out, and that when set at large their liberation would be effected in places likely to secure them plenty of food and shelter. If freshly-landed birds, with their wing-feathers cut, weak from a lengthened voyage, be turned out in such miserable plight in the precincts of a town, it requires no conjuror to foretell the result. These birds would have but a sorry chance of living, and cats would fare daintily; yet this has been done in the name of acclimatisation.

Every rural settler must have observed that our native Anatidæ form an important group in the fauna, a fact sufficiently suggestive of the wisdom of adding more birds of the duck tribe. Where Nature tells us we must succeed, should we be neglectful or indifferent? Nor should it be forgotten that some of the native species are nearly related to birds of the highest culinary excellence. From our intercourse with Australia, America and Europe,

without serious difficulty, we might obtain water-fowl of the choicest kinds, which would ultimately prove of great value. The success which has everywhere attended our introduction of the pheasant and quail encourages the belief that further valuable acquisitions to the fauna might be obtained from the great food-supplying families Phasianidæ and Tetraonidæ, and much of the food of these birds would be drawn from sources which would not be otherwise economised.

After this brief review of changes in our fauna now taking place from the introduction of foreign birds, the effects of colonisation on the habits of those species which we know as indigenous should likewise be carefully considered. The wide-spread cultivation of the soil, the introduction of many foreign fruits and plants, the reproduction of domestic animals, by the European colonist, have each in turn influenced the habits of certain of our birds.

Our falcons have been persecuted so persistently that their race has been greatly weakened in numbers. Unfortunately for them, their extraordinary courage has not yet been tempered with discretion; a bold dash is now and then made amongst poultry and pigeons; but these predatory attacks, intermittent and uncertain, have not influenced their food-acquiring habits in any marked degree. To the more wary harrier, with its greater indifference as to the quality of its food, its grosser appetite, colonisation has added much to its means of living; from swamps and lagoons frequented by ducks and rails, it has been tempted to visit sheep-farms in great numbers: it feeds greedily on carcasses or offal; it may be observed also lightly soaring over rabbit-warrens, and an examination of its castings discloses the help it lends in checking the too rapid increase of a most prolific rodent. Owls should be cherished as amongst the number of our best friends: we have found many specimens of their pellets wholly composed of the fur and bones of mice. The cry of the "more-pork" at the barn and rick-yard should be hailed by the farmer as the greeting of a welcome guest: the wanton destruction of an owl is a public robbery, which should be punished with as much severity as sheep-stealing.

Halcyons have sensibly increased in numbers as cultivation has spread; they are true allies of the gardener and farmer, and clear off hosts of insects that infest or devour the produce of agricultural labour. These birds follow closely in the wake of the settler, and may be termed common where they were a few years since

considered rare; last breeding season they were found sixty miles at least inland. The clear-voiced bell-bird affects orchards and gardens where fruits and flowers abound, and assists in propagating several species of berry-bearing shrubs. The garden likewise has become the shelter and the feeding-ground of the omnivorous Zosterops, which may be looked upon as the most successful of self-invited colonists. The tiny wren (*Acanthisitta*) reproduces its kind amongst the improvements and amidst the bustle of the woodland homestead; its nest has more than once been found in the mortice-hole of a stockyard-post. Its appetite has become depraved to a certain extent, perhaps, by its close acquaintance with the pakeha, as dead bodies of this pretty little species of creeper have been found in hog-tubs—the floating particles of fat had been the tempting but fatal lure. The gray warbler (*Gerygone*) is now a constant inhabitant of the garden (it has learnt to supplement moss, lichens, spiders'-webs, and other nesting materials with threads of cotton or worsted wool, &c.), and suspends its cleverly-constructed home from the hanging sprays of the blue-gum (*Eucalyptus*), or fixes it within the sheltering hedge of gorse (*Ulex*); this habit affects the domestic economy of the cuckoos, for both *Eudynamis* and *Chrysococcyx* makes use of this warbler as a dupe. Last summer instances occurred of both these migrants being reared in gardens in and around the town of Christchurch; and the whistling cuckoo (*Chrysococcyx*) was more abundant there than usual. The tit (*Petroica*) haunts gardens and watches the labourer upturning the soil with all the confidence that is displayed by the redbreast at home. The brown creeper (*Cerchiparus*) visits the meat-gallows of the stations, for the sake of picking off morsels of fat, and is often associated when so employed with the noisy paroquet. The latter species takes tribute from the corn-field and fruit-garden when an adjacent bush affords it a refuge. Flycatchers (*Rhipiduræ*) of two species frequent sheds and houses, in the autumn especially, finding abundance of food in the minute insects that infest man's habitations; this habit we noticed after the domestication of the house fly, said to be introduced here by the cattle ships from Australia. The raptorial habits developed in the kea (*Nestor*) in certain alpine districts is an interesting and peculiar incident in bird history. The omnivorous woodhen, which shows so strong an inclination to avail itself of the advantages of the settler's improvements, is too mischievous to be tolerated; the

farmer's dogs act as police to restrain or deter from pilfering this Arab of the bush. The pukeko, or purple gallinule (*Porphyrio*), and the paradise duck, or New Zealand sheldrake (*Casarca*), are not esteemed as friends by the farmer, who begrudges them the tender grass or growing grain which attracts them to his land. The gulls (*Laridæ*), which follow the labours of the ploughman with beneficent industry, have lately discovered a fresh and abundant food supply: since the establishment of meat-preserving and boiling-down factories in certain spots, these birds may be observed collected together in thousands, feeding on the refuse which has been carted away from these great butcheries. The common tern (*S. antarctica*) constantly follows the newly-turned furrow, and greatly benefits the agriculturist by its persevering search for larvæ and other insect food.

It may be gathered from these remarks how many species of native birds seem to be natural allies of man in checking the undue increase of that which is hurtful to his interests, and which in such a climate might become a plague but for their interference and assistance.

Acclimatisation, which is effecting daily changes in our bird system when successful, constantly records the history of its progress with the music of fresh notes and calls resounding from shrubberies and plantations. The sounds of our native vocalists are not less worthy of attention. With diffidence I propose to offer some observations on the vocal characteristics of our birds, and note their love songs, alarms, notes of warning or defiance, together with some of the various and peculiar cries to which gregarious birds give utterance.

To those familiar with the wilds of nature, much of the real history of bird-life is disclosed by their notes; for instance, if the voice of the halcyon were heard from the first day of August to the month of January (the breeding season), it would not be necessary to see the bird in order to form a tolerably correct idea of the nature of its employment.

Bird-sounds, as received by the ear, it is impossible to reduce to writing, nor do I believe it will be achieved till science shall have instructed us by some method to render in intelligible language the many fleeting forms and figures which the Babel tongues of sound impress on the wavelets of the surrounding air. Formidable discovery! then we shall hold as a priceless truth that, if speech is

silver, silence is golden! But although it seems impossible to write down bird-sounds, yet a notion of their effect on the air-waves might be hazarded. For the purpose of explanation, let us suppose the existence of an undisturbed mass of air; could not the figures described therein by the calls of various birds be idealised into forms, and a symbolic rendering of the sounds of bird-language be produced? As illustrating the meaning in view, let us suppose that the sharp jarring scream of the falcon would be represented by a figure somewhat like a barbed lance; the call of the cuckoo (*Chrysococcyx*) would be pictured in gently sweeping curves; whilst an acute angle would typify the scream of the weka (*Ocydromus*).

From the notes and observations I have made, I have no doubt that birds breed here in every month of the year; and according to generally accepted opinion, therefore, we ought not at any time to lose the music of the woods. But there are active agencies at work which are quickly rendering whole districts comparatively mute, and these will be presently touched upon. At night we hear the sounds of birds high up in the air, as flock after flock seek the coast or the brackish waters of the shallow mere. These notes are probably, as Gilbert White said, a safeguard against dispersion in the dark, or may convey some intimation of any change in the order of flight; they are usually briefly yet deliberately sounded. Sea-fowl are far from silent when on their course, ascending rivers or roaming above the harbours and bays that indent the shore. Living close to the beach in a sheltered nook in Port Cooper, at no great distance from the extensive area of Lake Ellesmere, it may be that I have been more than usually attentive to these wandering voices, since few woodland birds now frequent the slopes of our picturesque hills, like many other districts once clothed with stately trees and bright-leaved shrubs. Shade and shelter gone, bare stems with whitened tops remain, and point to the work of the ruthless bushman. Often at night, about the second week in January, the shrill piping of the oystercatcher (*Hæmatopus*) is heard, and, soon after, the yelping cry of the stilt (*Himantopus*), apparently from a great height. These waders are amongst the earliest to quit their inland breeding haunts and bring their pied broods towards the coast: they are on their way to join or assist in forming the large flocks which during the autumn and winter spread themselves along the shores and over the flats and harbours, where abundance of food can be procured.

Many genera that must in all fairness be termed gregarious utter their calls and cries with frequent repetitions, and that, too, in broad daylight. Can we divine their meaning? Let us observe which are the noisy species. Flocks of terns may be heard screaming at some distance, as in open order and at no great height they stream across the country, foraging by sight. Is their squealing cry uttered in rivalry, for companionship, for encouragement, or satisfaction at the prospect of a well-filled gullet? Watch a flock of the same species hovering over a river, and should anything unusual, such as a dead bird, be borne down with the current, a clamour at once arises. How swiftly is the news spread from bird to bird! In a brief space hundreds are wheeling and screaming over the object of attraction. In this case the call conveys intelligence; it is analogous to the bushman's "coo-ey," attracting instant attention, and summoning the presence of all within reach of its sound. In the instances given the call-notes used appear very similar. By way of contrast, stroll across one of their breeding-grounds when the down-clad young lie in couples without the slightest shelter. Fiercely is the intruder assailed; the harsh scream becomes intensified, and plainly expresses anger, defiance and would-be intimidation, for the brave little tern protects its nestlings, even against man, with a courage unknown to the more powerful gull. Our large gull (*Larus dominicanus*) will drive away the egg-stealing harrier, which soars aloft in wide circles on silent wing as the gull chases it from the neighbourhood of the sandy shore or rocky cliff where the roughly-built nest protects the brown-blotched eggs; it marks each dashing stroke with a short bark of anger, and returns from the pursuit with hoarse, gratulatory noise; but when man assails its treasures the miserable bird wheels aloft, and, circling round in company with its neighbours, breaks forth into loud despairing cries that sound like thick-voiced mocking laughter. There is no *levée en masse* as with the plucky terns; there is no attempt made to defy or inspire fear; but, securing itself from danger by ascending in wide circles, the loud-voiced sea-fowl looks down on the plunderer in timid helplessness, uttering incessantly its wailing lamentations. Look at that flock of gulls which surround the shipping lying at anchor near the breakwater! What a busy picture of noisy activity! It is life at high pressure, and stands out in bold relief to the rest of the scene, where all around lies still and silent, steeped in the full glare of noon. Some are ranging restlessly in

circles, and swiftly then shadows come and go upon the glancing waters; others sit lightly and gracefully upon the rising swell—all on the look-out for scraps that may be thrown overboard or swept through the scuppers of the ships. Suddenly one quick-eyed bird pauses in his flight, hovers an instant, from beneath the snowy tail-feathers drawing his pink feet, which for a brief space dangle in ungainly fashion ere they clutch the water. Now he has snatched some bulky morsel; what a vociferous outcry, as half-choked he strives to gulp it down! his wings, not yet close-folded, he spreads again for flight: attacked on all sides by his clamorous fellows, he drops the envied lump, and instantly joins the common flock in chase of the lucky bully that has swept off the prize. The pursued now becomes the pursuer, and this continues until some widely-distended throat at length entombs the object of this fierce contention. Here the birds among themselves, without man's interference, show an amount of boldness that appears remarkable; the air resounds with their sonorous cries. Seldom, if ever, is the hunted bird struck by his companions; he yields his prey from fear, or drops it in the attempt to obtain a fresh hold and by another catch place it more easily for swallowing. If lost from fear, can it be from dread of the menacing blow that seldom if ever descends? has it not instinct enough to appreciate the threatened attack at its true value, judging from its own harmless bullying?

On the mud-flats at the head of the harbour, patched here and there with a dwarf growth of *Zostera* and banks of time-bleached shells, as the tide ebbs, flocks of godwits (*Limosa Novæ-Zelandiæ*) arrive and probe the yielding surface with their long bills; their call cannot be distinguished from that of their European congener, although now and then a yelping sound is emitted without any apparent cause, unless it be a note of satisfaction, for they feed silently. Noisier, and far shriller in their notes, are the oystercatchers, which feed in company, wade in the shallow water, or course along the margin with swift-plashing run. When the pied stilts feed in numbers by the shores of Lake Ellesmere their notes are constantly repeated, sounding not unlike the barking of young dogs, whilst the oystercatcher's shrill note rather resembles the running down of an alarm in the rapidity with which the sound is repeated. The call of the paradise duck (*Casarca*) is often heard in lofty flight, bringing to mind the notes of the wild geese at home. Some fancy they can detect in the hoarse call of the paradise drake

the words "Hook it, hook it!" as a hint to escape, whilst the shriller cry of the duck inquiringly replies "Where, where?"

Amongst other species which use the voice in company, and seem to enjoy the chorus, the lark may be mentioned, as it usually utters its sharp "chirrup," "chirrup," on taking wing. The same note, or one vastly like it, is used for encouragement or to incite watchfulness when a flock in loose order are near a harrier hawking close to the ground, or perched on some commanding stone or ti tree. When the blight birds (*Zosterops*)—which might safely adopt as a motto "*Fruges consumere nati*"—crowd about a tree, peering through the leaves, thrusting their sharp beaks into the fresh pulp of luscious plums, they constantly twitter, as they also do when shifting to fresh food; the call-note, not unlike the chirrup of the sparrow, is always quickly answered. Their power of song as yet does not seem to be appreciated as it deserves. I have heard individuals sing their sweet low notes in a way that would charm the most exacting bird-fancier that ever gathered chickweed. The notes of the bell-bird, as it trips up and down the scale with a cough at the end, are too well known to need further notice; one of their concerts, with a full chorus, is a delightful treat that sometimes rewards the early riser. The graceful parrakeet utters a gratulatory note as the flock hastily assembles to some favourite food, as on the stooks of an oat-field; this differs from their call when on the wing, as much as it does from that low confidential murmur in which I have heard a pair indulge about nesting-time. The kaka in his leafy domain utters his harsh grunt of satisfaction as he and his mates scramble about the bending boughs that yield a honeyed food. How shall I attempt to describe the song of the tui, with its sudden bursts of melody, ringing the changes upon notes merry, plaintive or harsh, in rapid sequence, as though the sympathetic voice felt and expressed every varying emotion that chanced to stir the lively bird? The attitudes assumed during the course of its recitative are well worth watching, although they may seem to detract somewhat from the pleasure of hearing it.

The kaka sounds his alarm harshly, hopping restlessly from bough to bough; nor does his warning cease whilst on the wing, gliding to safer quarters. In the moist *Fagus* forests, whose glades are carpeted with the deepest moss, the beautiful green wren sounds his cheepy cry, denoting danger, with a most confident air. Away out on the open ground or sandy river-bed, how often does the "twit,

twit," of the banded dotterel, or the sharply-uttered "ti-winkle, ti-winkle," of the redbill or oystercatcher, help to moderate the weight of the sportsman's bag? the paradise drake lifts his head, sounds his "kowonke," from a fast walk he hastens to a run, and at length sails away with his shriller-voiced mate.

Very noticeable is the faculty which birds possess of hushing their young to silence, and of bidding them hide at a moment's warning, perhaps by the sound of a single note. Amongst some species of waders this obedience to parental guidance is most observable; young stilts, plovers or redbills that have been rambling over their feeding-ground, at the sound of alarm suddenly seek cover, and only after the most careful scrutiny may be found lying *perdu* behind some sheltering stone. Perhaps the most monotonous amongst all the calls of our young birds is that of the large gull (*L. dominicanus*): when nearly fully grown—about the months of April and May—it follows the old bird with untiring perseverance, clamouring for food with a long squealing cry. I have heard it on the beach, whilst it has been wheeling round and round to reach its parent's bill, in hopes of a supply, till the sound has become quite tiresome to listen to. By way of contrast to the patience of the old gull, it may be noted that the young of the Petroica when full grown, as it is by December, is driven off by both parents with something like harshness both of tone and gesture. The fierceness which is displayed by the common tern (*S. antarctica*) in defence of its young has been already noticed; a similar degree of courage is met with in the case of the falcons and the little gray warbler (*Gerygone flaviventris*). On nearing a taratah (*Pittosporum eugenioides*), where some young warblers were perched, the old birds commenced a furious attack, darting close to the face, precisely after the manner of the common tern, and, allowing for size and power, uttering a similar jarring scream to that bold bird. With the falcons the utmost perseverance is exhibited in driving away a foe. In December last, up the gorge of the Lawrence, a pair of bush hawks (*Falco ferox*) assailed one of my sons and myself for a space of two hours whilst in the neighbourhood of their young; then the usual swiftly-uttered "kli, kli, kli, kli" was even more rapidly sounded, whilst its tones were savage and threatening. The young at the time were able to fly some little distance, yet only one moved once, that we could observe, from the instant the note of alarm was given. The bronzed-winged

cuckoo, or whistler (*Chrysococcyx*), always makes known his presence with an oft-repeated whistle; the long-tailed koekoea announces his arrival with deep-breathed note: these love-calls are unlike all other of our bird-sounds. The wild scream of the weka-rail tells us of his whereabouts from a considerable distance; and this most confident of rails is as noisy by night as it is by day. When sitting still in the bush I have seen a weka silently approach and give notice of my presence by a strange note, which, although delivered within a few feet of where I was sitting, sounded like wood being struck at a great distance off.

The remarkable notes of the owls must not be passed over silently; for the name at least, if not the appearance, of the more-pork (*Athene Novæ-Zelandiæ*) is well known throughout the colony. Australian settlers distinguish a podargus by a similar name, whence the colonial epithet (whether of New Zealand or Australian origin is uncertain), applied to a dawdling person, who is often described as "a regular old more-pork." The call of the wekau (*A. albifacies*) is vociferous, wild, often startling from their heavy slumbers the inmates of the mountain huts. Probably the clamour of this genus, like that of *Falco*, is a means of startling some of their prey into motion. The large owl is said to have likewise a call somewhat similar to the more-pork, but much more gruff in tone. Laughing-jackass is one of the names conferred on the wekau; this distinction is conferred on an Australian bird as well as by some of our sea-birds amongst the petrels or *Procellariidæ*.

When the south-east wind blows on our east coast, bringing with it thick hazy weather,—when curling mists drift up the harbours and hide away in their vaporous mantles hill and mountain, shearing the landscape of its fair proportions,—the curious note of a petrel may be heard from dusky eve till early morn, not only about the harbours and estuaries, but far up the river-beds to the gorges in the vast mountain chain of the southern Alps.

Amongst the most silent of our birds may be named the shags (*Pelecanidæ*), the harrier, the heron, and the grebe, whose voices, except during the breeding-season, are rarely heard. The squeal of the harrier is most infrequent, considering what a very common bird it is. In the breeding season the scream is heard from a bird soaring high in air, or frightened from its nest, or suddenly driven off its prey, occasionally only from a bird on the wing hawking over burnt ground, which has disclosed perhaps an unusual

abundance of lizards. The cries of birds in several cases appear to be more or less dependent upon atmospheric changes. At such times gulls become vociferous, restless, soaring aloft with rapid unsteady course, and wekas are very noisy; on the other hand, many species are silenced altogether by bad weather. The thrush, of many notes, utters some so like those of other birds as to become rather puzzling, should one try to fix on the unseen performer. The flute-like mellow pipe of the wattle-bird (*Callæas*) is unrivalled for its sweetness. The little creeper (*Acanthisitta*) never moves without emitting its tiny twitter. The kingfisher is generally silent, except during the breeding season, or its note is used to intimidate, either in attempting to seize a post already occupied by one of its kind or when defending its position from an attempted intrusion; thus our halcyon differs in habit from the kingfisher of the old country, which is said to utter its cry whenever it takes wing.

Notwithstanding the gush of song which in summer-tide salutes the cool dawn before the rosy hues have fired the eastern sky, many of our little melodists retire late to rest, such as Anthornis, Petroica, Gerygone and Zosterops, and their lingering notes may be heard long after sundown.

Often is observation made upon the readiness with which some species of our native birds learn to imitate the human voice, an accomplishment which is also popular; yet, as an exhibition, the result of long practice and frequent repetitions, I am inclined to place it in the same category as a man's imitation of the crowing of a cock. I have known a grave senator mimic "the cock's shrill clarion" well enough to threaten the harmony of a farm-yard. Some persecuting enthusiasts find that the kaka, parakeet and tui are the most apt to acquire this power of uttering sounds that bear a fancied resemblance to words.

In the foregoing notes the voice of the large gull has been more than once mentioned. On the mud-flats or sand-banks, when a small flock of five or six of these birds are met together, after a few deep-toned barks or growls, they hold a regular "tangi," and utter most dismal wails or yells, or what seems like a dialogue or discussion takes place, very often received by the auditory with mild barks that might well pass for applause or "loud and continued cheers." This habit, not confined to the large gull, is also possessed by the smaller species, tara-punga, although the latter is less noisy. The terns, too, meet in parliament on the shore; and a solemn

conclave of oystercatchers may sometimes be noticed standing in unusual repose, at intervals only uttering a shrill pipe, and *this*, when, close at hand, the godwits are working in their tripod fashion to extract a dainty morsel from the ooze.

Attention has already been directed to the fact that in the alpine districts of New Zealand the notes of the birds are pitched in a higher and richer tone than in the valley, and in some of the most elevated woods which the bell-bird frequents we have found the note or brief song of the hen bird especially delightful. Whence this result? Is it due to the effects of inspiring the keen mountain air? to the quality of its food being climatically altered? If we notice some of the fruits and berries from which it derives some portion of its support, we shall find that the black berries of *Aristotelia racemosa* are represented in the alpine fastnesses by those of *A. fruticosa*, the pulpy fruit of *Coriaria ruscifolia* by that of *C. thymifolia* and *C. angustissima*, whilst the drupes of *Coprosma lucida* and those of many other species have their mountain representatives in *C. cuneata*, *C. acerosa*, *C. linariifolia* and others. Will the chemist tell us, from analyzing these fruits, that this change is enough to cause some modification in the muscular apparatus that modulates the tones issuing from the larynx? The scientific ornithologist would admit no specific difference after inspecting a score of skins; for length of feathers, colour of plumage, point out the bird as *melanura*.

As to the reason for the bell-bird's song being pitched in a higher key, it may perhaps be found in the fact that thick mists often envelope the mountain's side; that the bushes in the more elevated gullies are much scattered, small, and isolated. Hence the alpine note is fitted to meet the peculiar physical conditions of certain localities, by enabling the sexes to communicate with each other when collecting food at some distance apart.

The power of imparting intelligence, as exercised by birds, must be obvious to anyone who is acquainted with the ordinary inmates of a poultry yard. In many feral species that have come under observation this faculty is quite as conspicuous as it is amongst many domesticated *protégés*. Last summer, for the first time, a few tuis appeared amongst the cherry trees in a garden up the gorge of the Ashburton, miles away from any bush frequented by the tui; for the first time cherries were tasted, the knowledge of their excellence was communicated, and the trees stripped by the

industrious tuis. Not a month afterwards, when slowly sailing up the harbour, one of the children threw a piece of bread to a young gull (*L. dominicanus*), the only bird in sight: its bark of pleasure brought others, till then unseen, and the wake of our boat was enlivened by an irregular train of noisy attendants. Those species which do not launch lightly in the air when taking flight, we believe, may be ranked among the more silent birds, as, for instance, the cormorants; birds of this genus seem to need a fulcrum in order to rise upon the wing. The fleet halcyon, too, when its perch is a bough, and it leaves it to dash at its prey, the bough may be seen to vibrate for some time after it has been quitted. Both of these genera may be fairly classed with the non-vociferous tribes, notwithstanding that the halcyon indulges in a variety of expressive notes during the breeding season.

I now leave with regret the interesting study of bird-sounds, and trust that others will prosecute further observations; for there is much to be learnt by the field naturalist about their notes and calls, which would assist in revealing many interesting points in the history of the fauna. In conclusion, let a few words be recorded for the preservation of our native fauna. It is a work of difficulty, except with a few, to get folks interested in this subject; amidst the busy swarm of men pressing onward in the struggle for wealth or position, how few out of the entire mass would think of turning aside, and thus lose a fraction of the time devoted to the toilsome climb of the social ladder. To those who do give thought to the matter, who consider the changes which the settlement of a country necessarily entails on the physical conditions of that country, rendered evident by local climatic modifications patent to every observer—to those the task of bird-preservation presents a host of difficulties. In the first place, there is that *vis inertię* to be overcome,—that dead weight of inaction so difficult to move,—that lazily finds expression in the sentiment so often uttered, that the disappearance of the native fauna is the natural sequence of Anglo-Saxon colonisation. It is almost needless to observe, the inference is not rendered truer, although it may gain greater credence, by much vain repetition. The most striking, not to say alarming, alterations that have rapidly followed the progress of European settlement in some districts are due to the fact that the conservation of forests is either much disregarded or entirely ignored. With the help of the drier nor'-wester, the grandest

fireworks—with scenic effects more brilliant and wonderful than the most skilful pyrotechnic display—may be enjoyed by any one who may happen to possess a few matches. With a box of these useful articles, which are far more effectual than the keenest American axes, national property to the value of many thousands of pounds sterling is annually disposed of. It may be a matter for surprise to foreigners that an amusement so costly to the many should be permitted for the gratification or enrichment of a few, entailing in its results, more or less immediate, the scarcity and enhanced value of timber and fuel, the necessity of irrigation, the erection of works for the conservation of rivers, the absolute loss of rich alluvial land, washed away by floods or swallowed up by hungry sands and single beds. The destructive results of timber burning and disforestation could be swelled into a very long list of evils that follow in its train, some of which are confessedly irremediable; it is sufficient for our purpose to point out one of the most serious obstacles to bird-preservation—one of the most active causes which has led to the increasing rarity of many species. These great fires, be it understood, usually take place at the very height and summer of the breeding season. To the naturalist, the mere mention of this fact is enough to show him that birds could not be taken at so great a disadvantage at any other time. Then there yet remains to be sipped, by the *Meliphagidæ*, nectarine juices, viscid, transparent; insects, developed in their perfect form or less active larval state, are busy on their feeding ground, about which restless *Certhiidæ* creep swiftly, using their searching probe-like tongues. The wealth of spring flowers has passed away, with all their varied beauty and fragrance; the burdened sprays, lately hung round with panicles or corymbs well stored with hidden honey, are now weighted with green drupes or berries, which, swelling with the warm breath of summer, give fair promise of rich harvests in the winter months, when, pinched by hunger, the wandering flocks follow the ripened fruits. This is the time when bush-fires are recklessly started on their wasteful errand. Driven by the force of furious nor'-westers, huge volumes of suffocating smoke invest the bending branches, crisp the parched leaves, and so prepare the forest for the roaring sea of flame that follows; nests, eggs, young birds perish in the general havoc; brooding birds, weakened by incubation, and parent birds that hover round their helpless young must fall in numbers; those that escape—

refugees on strange, perhaps sparsely-furnished feeding grounds—lose their chance of increase for the year; hence the match, after all, does more execution than the gun, even at a *battue*. When at length we can find leisure to raise our thoughts from to-day to care and to act for to-morrow, this state of things will no longer be endured; the commercial element will step in and record its veto against destruction, not from any feeling of sentiment,—for commerce, whose only real law is gain, would chaffer away every tree in the country if a margin of profit attended the transaction,—but because it will find out that the preservation of forests can be made to pay.

At times it has appeared as if the advisability of fostering and encouraging the reproduction of many useful species of our fauna had taken hold of the minds of the people, and legislative enactments have pointed in that direction; but the advance has been but slow and halting, notwithstanding the encouraging success that has attended the introduction of the present imperfect laws for the protection of animals. It would not be difficult to show that the extension of the schedule of protected species would be beneficial to the colony: we import so-called insectivorous birds at a vast outlay, and kill off our own insect-eaters in countless numbers.

After paying attention for many years to the habits of our birds, it is confessedly a matter of difficulty to understand what principle has guided the selection of protected species. For instance, we profess to shield those beautiful waders, the stilts, during the breeding season, and with superfluous care other birds which are not known to exist here; yet on what food do our native Charadriidæ live, that they should be overlooked? We protect the bittern, whilst the noble-looking kotuku is exposed to the murderous gun at all times in the year; the tui is cared for, whilst the ticke, kiwi, and flocks of other useful birds may be exterminated without a word.

The idea at once suggests itself that the New Zealand Institute might do good work in advocating the protection of such species as, from a knowledge of their habits, it could recommend as being of service to the country. The first step taken, other advantages might accrue from the interposition of the Institute. Under its direction a list could be prepared of desiderata of real value, as welcome additions to the fauna or flora of those remote isles; a list

so prepared and recommended could not fail to have some weight with the various acclimatisation societies of the country.

It would not be a matter of much regret if the present irresponsible system of acclimatisation were stopped before mistaken zeal results in further errors. This is a delicate subject to deal with, and I trust it will not be considered impertinent to question the infallible wisdom of acclimatisation councils. The time may come when the antipodean sparrow controversy may be renewed here; when that grand bird, the black swan, useless or unsavoury as food, a disturber of the broods of less powerful Anatidæ, may be regarded as an acquisition of doubtful value; whilst the country might trust, with something like security, that such an ignorant and expensive blunder as the introduction of the weed *Anacharis alinastrum* would be avoided. Acclimatisation societies might expend some energy in the re-establishment of the most valuable of our native fauna. This would prove a useful if not a very showy occupation; dwellers beyond the narrow confines of our shores would take an interest in the progress of such a work; yet it must be candidly avowed that attempts in the direction indicated would be attended with little of the *éclat* which now accompanies the announcement of every newly introduced wonder and advertises each local society.

Nevertheless, by all means in our power, let us preserve our native birds. Let it not be forgotten that within our narrow boundaries are many very singular forms; that our fauna comprises about a score of indigenous genera, of which not more than two (*Prosthemadera* and *Hymenolaimus*) come under the Bird Protection Act. These peculiar forms are of very great interest to naturalists and physiologists the wide world over. We shall justly incur the opprobrium of barbarism if we neglect to use strenuous exertions to avert the fate which seems impending over them. No excuse that we could offer for indifference will palliate our destructiveness in the eyes of the scientific world.

In this, as in former papers, when attempting to describe the habits of several species, I have thought it desirable to point out the utility of many native birds to the agriculturist and the gardener. In fact, the preservation of our birds should enlist not only the attention and co-operation of the man of science or the naturalist,—the subject has a just claim on the consideration of the political economist, the farmer, the gardener, the sportsman,—not

only on the rural settler, but also on the townsman. The sooner this is understood and recognised the sooner may we expect to see some well-directed steps taken to secure an object of so much interest to the country at large.

T. H. POTTS.

Food of the Noctule Bat.—A few weeks since a gentleman at Cromer slightly wounded in the wing a noctule bat which he shot at, and has since kept in captivity. It feeds freely on flesh-flies and also on cockchaffers, of the latter of which, on one occasion, it devoured upwards of thirty in about half-an-hour, as I am informed by its possessor. This bat rejects the horny elytra of the cockchaffer, contenting itself with the softer parts of the insect.—*J. H. Gurney; July 15, 1874.*

Rabbit with one Ear.—Last week my attention was called to a rather extraordinary *lusus*, in the shape of a fine healthy full-grown rabbit, of the wild colour, which was born with only one ear. This ear was in its proper place, on the right side of the head, but on the left side there was not the least sign of an aperture or the rudiment of another. When carried erect the ear leaned a little to the left, just enough to give it the appearance of being on the top of the head at a short distance.—*J. Gatcombe; 8, Lower Durnford Street, Stonehouse, Plymouth, August 10, 1874.*

Honey Buzzard near Huddersfield.—A honey buzzard was shot in Storrs Hall Woods, near Huddersfield, on the 28th of May, 1874. The gamekeeper said he had not seen one in this neighbourhood for nine years. It measured four feet nine inches and three quarters across when the wings were extended.—*J. E. Palmer.*

Montagu's Harrier.—I have before mentioned that the frequent occurrence of this species in the West of Cornwall, and especially in the Lizard district, has rendered it not only a common bird, but decidedly the most common of all the Circidæ; and I mentioned on a former occasion that there was really no need to exterminate the species or to try to do so, as a bird of prey, as it has been ascertained beyond any doubt that its food is principally confined to reptiles, and not birds, and that where a solitary partridge or quail may once now and then fall within its clutches, nine times out of ten at least you will find that toads, frogs, vipers, snakes or lizards are its objects for food. A good many of these harriers have been in the Lizard district again this year; and Mr. George Williams, on whose property they were seen, told me that his keepers have been urging their destruction as game-destroyers, as deserving no credit for possessing any possible compensating good qualities. Specimens of this harrier have been killed from the same property nearly every year for some years, and they

have in most instances come under my notice. Vipers have been found in their craws, and I had notice that these keepers of Mr. Williams had set gins to catch them, and the only lure that succeeded in drawing them to their fate was a viper, which was laid on the plate of the gin, after small birds, eggs, &c., had been in vain tried. Two more of these interesting harriers were sent by Mr. Williams for preservation to Mr. Vingoe's workshop this week—a bird of the year with an uniform tawny breast, and a male bird in the second year's plumage. I was fortunate enough to obtain from Mr. Vingoe the result of his *post mortem* examination of the contents of the craws of these birds, and, instead of any game being detected, nothing could be seen but the remains of several lizards and only one small bird, probably a young sparrow. My object in this notice is simply to endeavour to enlist this beautiful and elegant harrier in some sort of favour, and to commend it to the regard of those who, like myself, wish to see the economy of the creation not treated with violence and injustice.—*Edward Hearle Rodd; Penzance, July 31, 1874.*

Nidification of the Snowy Owl in Confinement.—Mr. Edward Fountaine, of Easton, in Norfolk, who for many years past has given much attention to breeding the eagle owl in confinement, and has been remarkably successful in doing so, has for the last few years turned his attention to endeavouring to accomplish a similar result in the case of the snowy owl. Mr. Fountaine obtained a female snowy owl in 1863, and four or five years after he also procured a male. The female laid one egg in 1870, four in 1871, and four in 1872, making a slight hollow in the ground for a nest in one corner of the large cage in which the two owls were confined; but all these eggs proved infertile. In 1873 Mr. Fountaine put another cock with the hen bird, after which she laid one egg, which was also bad. Towards the end of May, 1874, Mr. Fountaine again put up the female owl with the same male she had been paired with in 1870, 1871 and 1872, and she laid her first egg on the 8th of June, a second on the 10th, and a third on the 13th, and incubated them closely till the 2nd of July, when she suddenly deserted them, perhaps owing to the great heat which then prevailed. On examination each of the three eggs thus deserted was found to contain a well-advanced chick, so that a nearer approach has been made to a successful result this year than previously, on which account I think it desirable to record the above facts. The male bird was savage and noisy whilst the female was sitting, and Mr. Fountaine describes his cry as consisting of several quick, gruff notes. The female while on her eggs occasionally uttered a kind of croak, but when she left her eggs to feed she exchanged this sound for a sort of shriek repeated two or three times.—*J. H. Gurney; July 23, 1874.*

Nesting of the Tree Sparrow.—As regards the nesting of the tree sparrow, I may state that I have known several nests and eggs of this bird in Scotch

firs on Oliver's Mount, near Scarborough, Yorkshire. The birds, however, as a rule, seem to prefer occupying the holes and cracks in the perpendicular sides of a stone-quarry near which the trees are situated. They also inhabit quarries in other parts of Oliver's Mount.—*Beaven N. Rake; Fording-bridge, near Salisbury, July 19, 1874.*

Mortality of the House Sparrow and Martin.—Mr. Morris, writing from Hayton, York, in the 'Times' of July 7th, says that martins have this year been as plentiful as ever, or nearly so, which tallies with my experience here; but swallows are uncommonly scarce in the Undercliff, more so than I ever remember. Mr. Morris tells us that five dead martins were found about the parsonage and church, and that the rest seemed to fly about in a bewitched sort of manner, and to go to their nests much less often than they would have done if feeding their young, which he should have thought only another instance of the capriciousness of birds had not the cause been too plain. There being no dates given, and nothing said as to the state of the weather, one is at a loss even to conjecture the cause of death. With respect to the mortality of the house sparrow, I am also puzzled, though it is the young that have perished. In former years I have found nestlings and embryo-chicks in the broken or perforated shells lying about, but never in such numbers; for instance, on the 26th or 27th of June, six dead birds were found on the lawn, one of good size, too, that must have taxed the parent bird's strength to carry. The addled eggs, I believe, are also removed, which is not the case with many species; and the nest of the sparrow is a model of cleanliness, all droppings and refuse being carefully removed. Though the weather was boisterous and wet, the young could not have been blown out, the nests being deeply embedded in the ivy, the leaves, scale-like, protecting and sheltering them; but the old birds suffer, the plumage of the sparrow being loose in texture and wanting in oily matter, therefore readily saturated, so they may have failed in procuring the required food, the young having an insatiable appetite, and the quantity consumed is prodigious, being brought, on an average, every three or four minutes—not mere crumbs either, but good-sized pieces. Though the well-fledged broods are fed almost entirely on bread, which is readily found in a neighbourhood like this, caterpillars and other grubs, as well as butterflies, are taken to the younger nestlings, the sparrow being an expert fly-catcher. I may remark in passing that butterflies, the white excepted, have been very scarce this year. The flower-beds and seedlings have been much injured this driest of seasons by the dusting of the sparrows, circular holes being made, and the seeds scattered in all directions but the right; but fortunately, though somewhat in the eleventh hour, they have discovered, in a sun-scorched bank, a shallow hole where the friable soil is well nigh pulverized, and there they dust themselves without let or hindrance. A white sparrow, fully fledged, was captured, but subsequently released, and

has been lately seen about the grounds. I can corroborate what is said by my lamented friend Dr. Saxby, in his cleverly written and interesting notes on the 'Birds of Shetland,' that "The nest of the house sparrow is built so substantially as to insure a proper temperature, so that the younglings do not perish of cold," though they do, I believe, from want of food. That the sparrow keeps its nest in constant repair, I am well aware, it being an interminable affair.—*H. Hadfield; Ventnor, Isle of Wight, July 17, 1874.*

Crossbills in Denbighshire.—On the 18th of July I saw two crossbills. I am almost inclined to think that they were young birds, and as there were numerous flocks of them about the county in the winter, I should not be surprised if they had bred here.—*W. J. Kerr; Maesmor, Denbighshire.*

Ravens Nesting in North Wales.—During the last week in April, when returning one day with a friend from an unsuccessful fishing expedition to a lake on one of the highest hills in North Wales, we observed a raven fly to a rugged and precipitous rock, and by the sounds of evident satisfaction issuing therefrom, at once concluded that a nest of young ones were enjoying their evening meal (probably a choice piece of Welsh mutton): we at once proceeded to the foot of the rock, and soon discovered the nest, built, as usual, in the most inaccessible place, and by clinging to the summit were enabled to look into it; it contained three young ones, apparently nearly ready to fly. My friend returned next day with ropes and procured two of them; the other fell down the cliff and was killed. The same day I noticed several buzzards, whose soaring flight and wild cry added yet a charm to the surrounding scenery, which for beauty and grandeur may be favourably compared with any in North Wales.—*W. J. Kerr.*

Lesser Spotted Woodpecker at Instow.—Four of these interesting little birds were seen on the 1st instant in the kitchen-garden of my friend Mr. Richard White, of Instow, and one of them, a bird of the year, was shot by his gardener as it was creeping up the stem of an apple-tree. Mr. White's garden is close to the Instow sand-hills, and some distance from any wood or trees of large growth; so the occurrence of these birds in such a locality appears to be somewhat remarkable.—*Gervase F. Mathew; H.M.S. 'Implacable,' Devonport, August 8, 1874.*

Song of the Swallow.—On the 30th of July I heard a soft twittering in the chimney: it was early in the morning: it was like the cry of the swift, but not so shrill; then it stopped, and then began again, breaking into a sweet, soft, gentle little song, and ending up with the trill of a canary. The voice was the voice of a swallow, but the song was not one I had ever heard before. On the 31st of July I heard the song again early in the morning, just about dawn; it was so round, so melodious, that every other bird seemed to be singing harshly and out of tune afterwards. Later in the same day, whilst in the cow-house, I heard the same low voice, but not being at the top of the chimney it sounded louder. On looking up I saw a

swallow perched on one of the rafters; then a second one came and sang this pretty little song, the first answered it, and the second went on trilling out the notes that had sounded like those of the canary; they seemed to be carrying on quite a conversation; then both sang together, and finally flew away.—*C. B. Carey; August, 1874.*

Early Congregation of Martins.—On Sunday, August 9th, I saw a vast congregation of martins, I suppose preparatory to their autumnal migration. I can safely state there were many hundreds in the flight, and think I should be safe in saying a thousand; amongst them were two or three sand martins, and perhaps a score or two of swallows. This I take to be very early for the departure of the swallow tribe, but I think there can be no doubt that they were collected for that purpose. On asking a man who resides by the side of the pond, he told me they had been there “most of a week,” and that the telegraph-wire, which passes close by the pond, is frequently laden with the birds, as close as they can sit, for more than a quarter of a mile in length.—*Stephen Clogg; Looe, August 17, 1874.*

Press Carrier Pigeons.—One of the most curious incidents connected with modern journalism is the regular employment of carrier pigeons in collecting intelligence for the daily and weekly newspapers. In the competitive exertions to procure the “latest intelligence,” it has been found that for short distances newspaper reports can be sent readier, cheaper and quicker by press carrier pigeons, flying a mile per minute, than by the postal telegraph. These aerial postmen are entrusted to resident correspondents in various places, ready to be despatched at any moment, whilst others are sent out by reporters to places where important events are transpiring. It is now no uncommon thing to see reporters at police courts, inquests, public meetings, &c., despatch folio after folio of “copy” by press carrier pigeons tossed through the nearest window, or thrown out of a train or steamer going at full speed. The attachment of these birds to the place of their birth, and their ability to find their homes from marvellous distances, are of course their distinguishing characteristics. A “columbier,” or home, is established at the various newspaper offices, and whenever a bird arrives with a message, the act of the pigeon entering its cot sets a call-bell ringing in the editor’s room, the bell machinery continuing in motion until attended to. Being expressly bred for press purposes—conveying news to our great cities—they are not the pure carrier pigeon (which is larger, heavier and slower on the wing, and not so well adapted for press purposes); but are of a special pedigree, bred by Messrs. Hartley and Sons, of the ‘Woolwich Gazette,’ Woolwich, from prize birds imported from the best lofts of Antwerp, Brussels and Liege, all “producteurs” being rejected which have not won a three-hundred mile “concours.” Press carrier pigeons owe their origin to Darwin’s principle of “natural selection,” or the “survival of the fittest.” In the struggle for life in connection with the compulsory flying of long

distances, the homing and flying powers of the pigeons are developed to a large degree, whilst the birds which cannot do the distance are necessarily lost and eliminated. The surviving or winning voyageurs become thus educated to the highest standard of perfection, and this system being continued through many generations (the flying distances increasing every year) a race of pigeons have been produced with powers which a few years ago would have been deemed impossible. Press carrier pigeons, though as a rule only used for short distances, in competition with the electric telegraph, can be specially trained to distances of five hundred miles, and frequently fly to England from Dublin, Brussels, Paris, Lisbon, and even Rome. The utilization of the instincts of birds for press purposes is being carried even further than this. An ocean homing bird, of great docility, intelligence and spirit, has been found in Iceland, which flies at a meteor-like speed of one hundred and fifty miles an hour, and is able to find its home, over sea and land, from any part of the habitable world. A pair of these birds, a few days ago, brought despatches from Paris to a lonely spot, congenial to their nature, in a wild and rocky part of Kent, within ten miles of London, in an hour and a quarter. Press carrier pigeons took the despatches on to the city, the whole distance from Paris to London—by actual parcel mode of conveyance—being done within one hour and a half. If the experiments at present being made in training and educating them continue successful, it is hoped by next summer to establish a daily miniature ocean mail between America and Europe, the whole distance to be traversed between sunrise in one hemisphere and sunset in the other.—*Editor of 'Land and Water.'*

Recent Occurrence of *Apteryx Haastii* of Potts.—I have much pleasure in communicating the fact of the occurrence of this rare bird, after a very long interval. Five very fine specimens, old and young, have been lately obtained from the West Coast: efforts were made to secure these much-prized specimens for the Canterbury Museum, but although a considerable sum was offered it was declined by the owner of the skins. Till the present time the only known examples were the two well-known specimens in the Canterbury Museum.—*Thomas Henry Potts; Ohinitahi, June 3, 1874.*

Glossy Ibis and Roller.—Fifteen years ago a fine ibis was shot near Lytham by the late Mr. Eden's keeper: it was sent to Sharples, of this town, to stuff; the man called it a "black curlew"; I saw it in the flesh: it was noted in the Preston papers at the time; from then to Mr. Eden's death I kept a look out for it, when I purchased it at the sale, a month ago. I have two fine rollers, one stuffed by Watson, of Carlisle, shot near that city about five years ago; this also was noted in the newspapers at the time: the other specimen I purchased from the late Mr. T. H. Allis, of York; he got it in Yorkshire during his business rounds: this specimen, a hoopoe and a golden oriole I got from him a few months before his death.—*J. B. Hodgkinson; 15, Spring Bank, Preston, August 10, 1874.*

Green Sandpiper.—On the 3rd instant, while travelling by rail between Instow and Fremington, I noticed three of these birds rise from a swampy piece of ground near the latter place. Two of these seemed to possess much lighter plumage than the third, so were probably young birds of the year, and I have no doubt were bred somewhere in the neighbourhood.—*Gervase F. Mathew; August 16, 1874.*

Rednecked Phalarope at Salthouse, Norfolk.—You may be glad to hear that on the 4th of July a female rednecked phalarope, in splendid plumage, was caught by a boy in the neighbourhood of Salthouse, in this county. It was unable to fly and could hardly stand, but swam beautifully in a basin of water, into which I put it, constantly dipping its beak and eating flies which I dropped near it. Its legs, toes, and their membranes were of a bluish gray colour, not green. It died in the evening; it was very thin. I could not see any wound, external or internal.—*Frank Norgate; Sparham, Norwich.*

Baillon's Crake near Huddersfield.—On the 29th of May a specimen of Baillon's crake was shot near Horn's Dam, Kirkheaton, near Huddersfield.—*J. E. Palmer.*

Baillon's Crake near Eastbourne.—An adult female was captured in this neighbourhood, on the 6th of August, in a very exhausted and emaciated condition. It contained in its ovary eggs about the size of pins' heads. This, I believe, is the only specimen ever found in Sussex.—*Arthur J. Clark-Kennedy; Eastbourne, Sussex, August 15, 1874.*

Shieldrakes breeding in Merionethshire.—On the 9th of July, when sailing on the estuary at Barmouth, Merionethshire, I saw several young broods of shieldrakes. This handsome duck is not uncommon in North Wales, sometimes inland, but more generally on the sea-shore; the extensive tracts of sand-hills (in some places honeycombed by rabbits) which run along the coast seem peculiarly adapted to its habits in the breeding season.—*W. J. Kerr.*

Ducks Breeding on the Rainworth Water.—The following ducks have bred on the Rainworth Water this year (1874), *viz.*:—several lots of common wild ducks, six or seven tufted ducks, four pairs of teal, and one pair of shoveller ducks, beside great numbers of coots and waterhens, and a couple or two of snipe. I saw a very curious piece of behaviour on the part of a pair of common sandpipers on the 3rd of this month (August). When walking round the lake with two friends we put a pair of sandpipers off a small piece of sand which had been washed out of the field into the lake by the heavy rains of 1872. The remainder of the lake has banks about a foot above the water, fringed with small rushes, so that there is no landing-place for small birds except this bank of sand. The sandpipers, after flying round and looking for a place to settle, made straight for four or five tufted ducks which were sitting on the water, rather widely spread, and attempted to

settle on the backs of two of them; they got within six inches, when the ducks, not seeming to relish the idea of such strange jockeys, flapped along the water, thus frustrating their design. The sandpipers, after two or three more rounds, tried to do the same thing on two more of the ducks, but were baulked again the same way as before; so, seeing that it was no good, they flew to the bottom end of the lake, about a quarter of a mile away, and dropped on some stones which are put to keep the banks from washing away.—*J. Whitaker; Rainworth Lodge, near Mansfield, Notts.*

Salmon in the River Coquet in the last Century.—As the abundance of salmon in former times is an interesting subject, I subjoin an extract from a letter in my possession, dated “Warkworth, 5 September, 1764.” The writer states that he is staying within sight of the “River called Coquet-water, abounding with salmon, which was sold this season for a penny a pound; they sometimes catch two hundred at one haul.”—*J. H. Gurney; Northrepps, July 30, 1874.*

Salmon Peal attacked by a Garfish.—One of our fishermen, a few days since met with much difficulty in taking a salmon-peal from his net; on looking for the reason he saw what he supposed to be the ends of a piece of stick protruding on each side of the fish, but on extracting and examining it he found it to be the under jaw of a garfish, known locally as a “long-nose.” There can be no doubt the garfish attacked the peal, rushing on it with sufficient force to thrust the under jaw completely through the peal, which must have broken off either by the force of the blow or by the struggles of each fish to free itself. The peal, which weighed nearly four pounds, was struck behind and just above the pectoral fin, the jaw of the garfish thus passing through the thickest part of the peal, requiring—if we compare the weight of a swordfish to that of a garfish—even greater velocity of attack in the latter to cause so great a penetration through a fish than it would in the former to penetrate many inches of oak-plank.—*Stephen Clogg.*

Proceedings of Scientific Societies.

ENTOMOLOGICAL SOCIETY OF LONDON.

July 6, 1874.—SIR SIDNEY SMITH SAUNDERS, C.M.G., President, in the chair.

Donations to the Library.

The following donations were announced, and thanks voted to the donors:—‘*Annales de la Société Entomologique de France*,’ ser. 5, tome iii.;

presented by the Society. 'Proceedings of the Zoological Society of London,' 1873, pt. 4, and 1874, pt. 1; by the Society. 'Proceedings of the Royal Society,' no. 152; by the Society. 'Proceedings of the Boston Society of Natural History,' vol. xii. pp. 369—432; vol. xiii. pp. 1—224; by the Society. 'Fifth Annual Report of the Trustees of the Peabody Academy of Science,' by the Academy. 'Sixth Annual Report of the United States Geological Survey of the Territories, embracing portions of Montana, Idaho, Wyoming and Utah; being a Report of Progress of the Explorations for the year 1872,' by F. V. Hayden, United States Geologist: 'Our Common Insects, a popular Account of the Insects of our Fields, Forests, Gardens and Houses,' by A. S. Packard, jun.; 'Catalogue of the Phalænidæ of California,' no. 2, by A. S. Packard, jun.; 'Catalogue of the Pyralidæ of California, with Descriptions of new Californian Pterophoridæ,' by A. S. Packard, jun.; 'Synopsis of the Thysanura of Essex County, Mass., with Descriptions of a few Extra-limital Forms,' by A. S. Packard, jun.; 'Further Observations on the Embryology of *Limulus*, with Notes on its Affinities,' by A. S. Packard, jun.; 'Record of American Entomology, for the year 1872,' edited by A. S. Packard, jun.; 'Third Annual Report on the Injurious and Beneficial Insects of Massachusetts made to the State Board of Agriculture,' by A. S. Packard, jun.; all presented by A. S. Packard, jun., M.D.; 'Sixth Annual Report on the Noxious, Beneficial and other Insects of the State of Missouri, made to the State Board of Agriculture, pursuant to an Appropriation for this purpose from the Legislature of the State,' by Charles V. Riley, State Entomologist; by the Author. 'The American Naturalist,' 1872, no. 12; 1873, nos. 1—12; 1874, no. 1; by the Peabody Academy of Science. 'Transactions of the Norfolk and Norwich Naturalists' Society, presented to the Members for 1873—4; Supplement, Norfolk Lepidoptera,' by the Author, Charles G. Barrett. 'L'Abeille,' livr. 10—12; by the Editor. 'Exotic Butterflies,' part 91; by W. C. Hewitson, Esq. 'The Canadian Entomologist,' vol. vi. no. 5; by the Editor. 'La Partenogenesi e Semipartenogenesi delle Api per Giotto Ulivi,' by the Author. 'The Entomologist's Monthly Magazine' for July; by the Editors. 'Newman's Entomologist' and 'The Zoologist' for July; by the Editor.

By purchase:—'The Zoological Record for 1872.'

Exhibitions, &c.

Professor Westwood exhibited specimens of *Haltica* (*Batophila*) *ærata*, which he had found to be very injurious to young rose-leaves. Also a portion of a walnut attacked by a Lepidopterous larva, probably a *Tortrix*, but he was unable to name the species, as it produced only an *Ichneumon*. It was the first instance he had known of a walnut being attacked by any insect in this country. Mr. M'Lachlan suggested that

the larva might be that of *Carpocapsa splendana*, a species which usually feeds on acorns; and Mr. Moore stated that he had bred that species from a walnut.

Professor Westwood made some remarks on the Yucca Moth (*Pronuba Yuccasella*, Riley), of which some fifty specimens had been sent to him, in the pupa state, by Mr. Riley; but he had succeeded in rearing only three of them. He exhibited a drawing of a portion of the insect, showing the peculiar form of the palpi, which were specially adapted for collecting the pollen, which it transferred to the stigmatic surface as the insect passed from flower to flower. He pointed out the great importance of the insect in the economy of nature, as it appeared to be the only agent by which the plant was rendered fertile. He directed attention to a description of the insect and its habits by Mr. Riley, in his 'Sixth Annual Report of the Insects of Missouri.'

Professor Westwood also exhibited some bees which had been sent to him from Dublin, having been found attacking the hives of the honey bees. They were smaller than the honey bee, and black, and he considered them to be merely a degenerated variety of *Apis mellifica*. He suggested the probability of their being identical with the "black bees" mentioned by Hüber. Also Hüber had spoken of bees which he called "Captains," which were furnished with "coronets" on their heads; but he suspected that these coronets might have been merely the pollen which the insects had collected.

Mr. Champion exhibited *Amara alpina* and other beetles taken at Avicmore, in Inverness-shire.

The Secretary exhibited larvæ, pupæ and imago of a Dipterous insect which had been found, in the larva state, in an old Turkey carpet. The larva was very long, slender and serpentiform, white and shining, and had somewhat the appearance of a wireworm, only much longer and without feet. Professor Westwood thought it might belong to the genus *Scenopinus*.

Mr. Bond exhibited some minute parasites from a bat, probably identical with *Argas pipistrellæ*; and also some Acari from a small species of fly: both were from the Isle of Wight.

Mr. W. C. Boyd exhibited two specimens of *Thecla Rubi* from St. Leonard's Forest, differing from the ordinary type in having a pale spot in each fore wing.

Mr. Wormald exhibited a collection of butterflies sent from Japan by Mr. H. S. Pryer.

Mr. W. Cole exhibited leaves of ash affected by some small dipterous larvæ (probably *Cecidomyia*), which caused the two edges of the leaflets to turn upwards and meet above, thus assuming a pod-like form. They were from West Wickham Wood.

Mr. F. Smith exhibited some earthen cocoons found in a salt marsh at Weymouth by Mr. Joshua Brown. They proved to belong to a dipterous insect (*Machærium maritimum*), one of the Dolichopidæ. They were found lying on the wet, salt sand or mud, and mostly fell to pieces when touched.

Mr. S. Stevens exhibited specimens of *Agrotera nemoralis* and other Lepidopterous insects from Abbot's Wood, Lewes.

Mr. Butler exhibited a very rare book on butterflies, which he accompanied with the following remarks:—

Notes on Lee's 'Coloured Specimens to Illustrate the Natural History of Butterflies.' (London, 1806.)

"The exceedingly scarce, if not unique, book which has recently come into the possession of Mr. E. W. Janson has not hitherto been quoted in any synonymic catalogue, and as it contains plates and diagnoses of no less than nineteen species, it is important, now that an opportunity has occurred, to record them at once.

Pl. I. *Papilio Hyparete*, *Lee* = (*Delias*) *Eucharis*, *Drury*. *Lee* remarks as follows:—'This specimen does not exactly answer the description of Linnæus, nor yet of Fabricius; yet it comes so near to both that there is no doubt of its being the same, either with some slight variation, or that the colours of the specimen have in some degree changed. The yellowish hue on the upper side of the anterior wings is described by them as being white; nor is any notice taken of the marginal flesh-coloured spots on the extremity of the posterior wings. It will not, however, by any means answer the description of the *Eucharis* of Fabricius: and *Drury* clearly describes *Hyparete*, as given here, and as mentioned by Fabricius, under the name of *Eucharis*. Linnæus has no fly under the name of *Eucharis*. The insect is in itself extremely beautiful and delicate, and when alive must be very brilliant.' Fortunately the figure in Clerck's '*Icones*' sufficiently determines what the *P. Hyperate* (*sic*) of Linnæus is; Fabricius, however, confounded the two species together as *Lee* has done. *Drury* figured and described his *P. Eucharis* in 1773; it was first described by Fabricius in 1775.

Pl. II. *Papilio Thersites*, *Lee* = *Papilio Turnus*, *Linn.* *Lee* says:—'Respecting this butterfly, of which Fabricius gives so detailed a description, Linnæus is wholly silent. It was either unknown to him or described under a different name. Indeed it so nearly resembles the *Papilio Machaon* of the latter that it may be considered as a variety of that fly.' The true *P. Thersites* is so entirely distinct that the 'detailed description' of Fabricius seems to have been of very little use to Mr. *Lee*. I think our American friends will hardly agree with his concluding sentence.

Pl. III. *Papilio Dido*, *Lee* = (*Colænis*) *Dido*, *Linn.*

Pl. IV. *Papilio Æneas*, *Lee* = *Papilio Zacynthus*, *Fabr.*

Pl. V. *Papilio Charithonia*, *Lee* = (*Heliconius*) *Charithonia*, *Linn.*

Pl. VI. *Papilio Achilles*, *Lee* = (*Morpho*) *Achilles*, *Linn.*

Pl. VII. *Papilio Plexippus*, *Lee* = (*Danais*) *Archippus*, *Fabr.* It is doubtful whether the *P. Plexippus*, *Linn.*, was not this species.

Pls. VIII. and IX. *Papilio Priamus*, *Lee* = (*Ornithoptera*) *Priamus*, *Linn.*

Pl. X. *Papilio Phœrusa*, *Lee* = (*Colænis*) *Phœrusa*, *Linn.*

Pl. XI. *Papilio Demoleus*, *Lee* = *Papilio Demoleus*, *Linn.* *Lee* remarks that this species 'is found both in India and the Cape,' proving that he confounded it with *P. Erithonius*.

Pl. XII. *Papilio Machaon*, *Lee* = *Papilio Machaon*, *Linn.*

Pl. XIII. *Papilio Paris*, *Lee* = *Papilio Paris*, *Linn.*

Pl. XIV. *Papilio Idalia*, *Lee* = (*Argynnis*) *Idalia*, *Drury.*

Pl. XV. *Papilio Leilus*, *Lee* = (*Urania*) *Leilus*, *Linn.*

Pl. XVI. *Papilio Hector*, *Lee* = *Papilio Hector*, *Linn.*

Pl. XVII. *Papilio Polymnestor*, *Lee* = *Papilio Polymnestor*, *Fabr.*

Pl. XVIII. *Papilio* —? *Lee* = (*Diadema*) *Pandarus* ♂, *Linn.*

Pl. XIX. " " = (*Castnia*) *Evalthe*, *Fabr.*

Pl. XX. " " = (*Diadema*) *Ange* ♂, *Cramer.*

"With regard to Pl. XVIII. *Lee* says:—'It has been said to be the fly mentioned by Fabricius, in the 'Mantissa Insectorum,' under the name of Calisto, No. 459, in the division of Nymphales Gemmati, but the description by no means corresponds with it.'"

Papers read, &c.

The Rev. H. S. Gorham read a paper descriptive of Endomycid Coleoptera not contained in his Catalogue "Endomyceici Recitati." Also some remarks on the Genus *Helota* (Nitidulidæ), and a new species belonging to that genus, from Japan.

Dr. Sharp communicated a supplementary paper on some additional Coleoptera from Japan.

Professor Westwood communicated Descriptions of new Species of Cetoniidæ, principally from the collection of Mr. Higgins, and accompanied by drawings.

The President announced that the Library of the Society would remain for the present at No. 12, Bedford Row, pending the result of negotiations in progress for its removal to more suitable quarters.

New Part of 'Transactions.'

Part III. of the 'Transactions' for 1874 was on the table.—*F. G.*

Notices of New Books.

The Birds of Shetland, with Observations on their Habits, Migration and Occasional Appearance. By the late HENRY L. SAXBY, M.D., of Balta Sound, Unst. Edited by his Brother, STEPHEN H. SAXBY, M.A., Vicar of East Clevedon, Somerset. Demy 8vo, 398 pp. letterpress, eight tinted litho plates. Edinburgh: Maclachlan and Stewart. London: Simpkin, Marshall and Co. 1874.

IN offering to my readers this extended notice of a book which is a posthumous collection and completion of Dr. Saxby's eminently useful labours in the cause of Natural Science, I consider it as much a duty as a pleasure to give a prefatory list of his contributions to the 'Zoologist.' During an editorship of thirty years I have had no correspondent who more thoroughly fulfilled my idea of what an ornithologist ought to be; a constant and expert observer, and a scrupulously accurate registrar of every observation. Whatever opinions may be entertained by others, and I am aware there will be many diametrically opposed to mine, I consider it an inestimable advantage that Dr. Saxby never yielded to the mania for name-changing, that rock on which of late years every would-be teacher has split, and which has been the great deterrent of those who, under happier auspices, would have gladly commenced the study of our British birds. This conservative spirit, if I may call it so, pervades everything Dr. Saxby has written; while his facts are new, his names are old and familiar as household words, old friends with familiar faces. Dr. Saxby's first contribution to the 'Zoologist' was in February, 1861, his last in April, 1871. The following list of his papers is, I believe, tolerably complete; the page of each is given to facilitate reference; but I ought to add that I believe every recorded fact has been transferred to the volume now before me.

1861.—Additions to Mr. Crotch's Notes on the Fauna of Shetland, 7425. Nest of the Redwing in North Wales, 7427. Notes on the Birds of Belgium, 7537 and 7625. Nest of the Snow Bunting in Shetland, 7709. Occurrence of Uncommon Birds at Balta Sound during the year 1861, 7753. Food of Birds, 7809.

1862.—Ornithological Notes from Edinburgh, 7880. Variety of the Common Gull, 7883. Notes on the Spotted Woodpecker, 7932. Habits of the Crested Titmouse, 7998. Tenacity of Life in an Iguana, 8006. Deposition of Eggs by the Cuckoo, 8164 and 8235. Unusual Situation of a Sandpiper's Nest, 8164 and 8235. Nest of the Twite, 8194. Curlew Sandpiper at Rochester, 8237. Sphinx Convolvuli near Sheerness, 8243. Barn Owl preying upon Fish, 8281. Note upon the Migration and Song of the Sky Lark, 8281. Manx Shearwater at Sheerness, 8287.

1863.—Glossy Ibis in Shetland, 8448. Iceland Falcon in Shetland, 8484. Greenfinch in Shetland, 8492. Woodcock, Moorhen, Pintail Duck and Pomarine Skua in Shetland, 8494. Honey Buzzard in Shetland, 8631. Food of the Dipper, 8631. Notes on the Snowy Owl, 8633. The Osprey in Shetland, 8677. Snow Bunting in June, 8680. Five Eggs in the Nest of a Common Snipe, 8691. Two Wheatears' Nests together, 8719. Variety of Hooded Crow, 8720. Colour of the Eggs of the Golden Plover, 8725. Green Variety of the Oystercatcher's Egg, 8725. Redshank breeding in Shetland, 8725. Fascination of Birds by Light, 8817. Gray Wagtail an Autumn Visitor to Shetland, 8819. Notes on the Rosecoloured Pastor, 8820.

1864.—Otter in Salt Water, 8872. Pallas' Sand Grouse in Shetland, 8888. Harp Seal in Shetland, 9090. Ornithological Notes from Shetland, 9091, 9124, 9230 and 9310.

1865.—Ornithological Notes from Shetland, 9401, 9435, 9484, 9518, 9566, 9587 and 9760.

1866.—Ornithological Notes from Shetland, S. S. 16, 61, 211, 288 and 473.

1867.—Ornithological Notes from Shetland, S. S. 537 and 688. Food of the Wood Pigeon, 561.

1869.—Ornithological Notes from Shetland, S. S. 1760. This communication bears the following postscript:—I am unwilling to resume my monthly notes without apologising to my ornithological friends for having left many kind letters unanswered. Having mentioned to the Editor, in a private communication, the cause of my temporary abandonment of my favourite pursuit, I can only trust that by inserting this he will signify his belief that, notwithstanding my long silence, my good wishes for the 'Zoologist' and its readers will continue unabated."

1871.—Ornithological Notes from Shetland, S. S. 2533. Great Gray Shrike in Shetland, 2561. Roller in Orkney, 2561.

At p. 3700 of the present series of the 'Zoologist' I published a brief obituary notice of this excellent naturalist, and I need not conceal that it was penned, evidently with a loving hand, by his brother, the Rev. S. H. Saxby. Dr. Saxby died in his thirty-seventh year,

having for twenty-five years kept an almost daily register of such ornithological occurrences as he considered worth recording.

The 'Birds of Shetland' is compiled, as it ought to be, in the form of an annotated list of species, and not as a diary. Although such a diary is repeatedly mentioned, and although extracts from it appear on almost every page, the arrangement of the matter is systematic, Mr. Yarrell's familiar classification and names being rigidly followed. To myself this list would have been more satisfactory if all reference to species not having a positive claim to a place in the work had been omitted altogether. I should have preferred, for instance, the non-appearance of that grand bird the golden eagle, which now stands at the head of the list: there is the strongest presumptive evidence that this species has visited Shetland; the author firmly believes such visits take place, but still he has never obtained a specimen. It may be said that it is of little or no consequence whether or no a bird that can readily fly a mile in a couple of minutes has actually alighted on these remote islands, but we must recollect the same argument might be applied in a number of other cases. The evidence in every case has to be carefully sifted and considered, and unless the specimen be absolutely obtained it is perhaps the wiser plan to omit it altogether. Whatever hesitation we may feel in admitting the golden eagle, there can be no doubt about the whitetailed, a bird which has frequently been seen, and the remains of whose nests still exist at Lund, in the island of Unst; and it may be remarked in passing that wherever such a fragment is perceived, or even fancied, throughout the islands of these northern seas, it is invariably pointed out as *the* nest to which the world-renowned baby was carried in days of yore. The following paragraph illustrates the boldness with which this bird formerly sought its prey:—

"This species is scarcely so shy as the golden eagle. It cannot be considered more courageous, for I have seen it driven away from a village by a single arctic skua; but probably its greater familiarity with the haunts of men renders it more confident. At the breeding season, however, necessity compels it to become less shy and even daring. In the year 1868 a pair which had newly hatched were a great annoyance to the neighbourhood of Balta Sound, although the nest was about eight miles distant in a straight line. So bold did they become at last that they would carry off poultry from the cottage-doors when the men were at the fishing, treating the women and children with the utmost contempt. Some years ago, one of the

same pair made a pounce upon a tame duck which was feeding in a barn-yard, but, being alarmed by a man who came out to the rescue, merely succeeded in seizing one foot, by which, however, the miserable captive was carried to the distance of about a mile, 'roaring for mercy,' as my informant asserted. The eagle then descended to a hillock, and there taking a firmer hold rose once more and continued on its way to the eyrie."—P. 3.

The following refers to the breeding habits of the whitetailed eagle:—

"There seems to be no doubt that the whitetailed eagle pairs for life, though whence and by what means a new partner is obtained when one has been destroyed is a mystery. Not many years ago, while a nest was in progress, the female bird was shot, and immediately afterwards the male disappeared, returning, however, in the course of a week, with a new mate. The latter was also mercilessly shot, but after an absence of about ten days the male once more returned, accompanied by another female, after which they were allowed to complete their nest and rear their young brood in peace. Although it is not until the beginning of May that the young are hatched, the birds are seen in the immediate neighbourhood of the nest as early as the middle of March, and shortly afterwards they begin such repairs as the wear and tear by the last brood, and the storms of the previous winter may have rendered necessary. Two eggs are usually laid, sometimes three; but I never heard of more than two being hatched. The only nest I ever saw containing eggs was in a high cliff in the island of Fetlar, rather nearer to the top of the cliff than to the bottom, and so placed beneath overhanging rocks that it could only be reached by means of a rope. It consisted of a mass of dead plants and sea-weed stalks, thickly covered about the middle with wool and hair. The eggs (on the 14th April) were quite fresh and of the usual roundish form, measuring three inches in length by two inches and three-eighths in breadth. In colour they were soiled white, with a few faint brownish stains—in all probability received from some damp or decaying substance within the nest. The shells are always hard and somewhat brittle, and the yolks pale in colour. During the last few years, a large number of roundish white eggs have been sold as those of the erne, but their small size, dull and chalky appearance, and exceedingly low price, ought to be sufficient to put intending purchasers on their guard. I think the young remain in their nest about six weeks. The male is occasionally seen upon the eggs, but by far the larger part of the task of incubation is performed by the female. At first the birds are quite shy, seldom venturing within gunshot, but they become much bolder after hatching has taken place, though they never, so far as I can ascertain, venture to attack an intruder. I have but once seen the young in the nest; they were a little more than a week old, and were covered with a dingy white down."—P. 6.

The osprey is a bird with whose figure, appearance and habits we are all more or less familiar; if we have never made his personal acquaintance, still the life-like representation of the fish-hawk and his traditional piscatorial achievements have been stock subjects with naturalists on both sides of the Atlantic for a long series of years. The following anecdote shows the rapidity with which this bold bird may recover his self-possession, even when his life has been in imminent danger.

“A singular instance of sudden terror instantaneously subdued occurred near the spot. Seeing an osprey with a fish in his claws flying across the water, at a considerable distance from the surface, I ventured a shot with a ball, missing, as usual. With a start and a cry, possibly of alarm at the sound of the missile, the bird suffered its prey to fall, but the latter had only dropped a few yards, when, with a sudden dash, it was recovered while yet in the air, and carried away to the summit of an opposite cliff, where, by means of my telescope, I watched the subsequent repast.”—P. 10.

Another passage illustrates the character of the crow as well as that of the osprey; the former seems to have been a most pertinacious tormentor. It is worthy of record that we find in the bird-world abundance of similar instances of the smaller species assailing and annoying the larger and more powerful, and we cannot always predicate the motives which influence the aggressor. This fearlessness of superior strength and capability seems a very general attribute of our feathered friends.

“Although the osprey will sometimes alight upon a flat surface for the purpose of devouring its prey, it seems to prefer a railing, the top of a wall, an isolated rock, or, in fact, any situation from which it can readily observe the approach of an enemy. Nevertheless, most of those which find their way into collections are shot in such situations while absorbed in their occupation of feeding. In Shetland, where trout are abundant, and but little care is taken to preserve them, it has but few persecutors; although in the hooded crow it finds both persecutor and friend, as I have at various times experienced to my annoyance. No sooner has the osprey begun its meal than the crow, with repeated swoops and loud cries, compels it to seek some more peaceful spot, and, immediately after picking up such fragments as may have been dropped, returns to the charge again and again until the comfortless repast is at length finished. Led by the outcries and peculiar behaviour of the crow, I have sometimes endeavoured to stalk the nobler bird, but invariably without success, the latter never being allowed to remain long enough in one place to enable me to approach within shot.”—P. 10.

Dr. Saxby writes very modestly on what he has done in reference to the Iceland falcon :—" Those who have taken the trouble to read my scattered notes on the Iceland falcon will agree with me in considering it rather fortunate than otherwise that my acquaintance with that species and the Greenland falcon had been comparatively slight, otherwise the confusion I assisted in promoting would have received a yet greater addition." When men of science thus perceive and appreciate their own shortcomings, it is a sure sign they may be taken as safe guides : this proof of their possessing the true knowledge of self is a guarantee that their communications will be instructive, a sign that they have eschewed the apocryphal and the untenable ; and I appreciate far more highly the volume before me from its containing such manly confessions. In the next paragraph we find an interesting and valuable hint on the disposition of the bars on the tail-feathers of this and other birds, and the statement of a fact I have not previously met with, that the feathers on the two sides of the tail are not necessarily similar. " It has been considered remarkable and somewhat suspicious," says Dr. Saxby, " that in both birds the markings on one side do not always correspond with those on the other, but the same is the case with the snowy owl, and would be far more frequently found to occur with many other species were it not the almost invariable custom to examine one side only of the bird." Then follows a note on the habits of the Greenland falcon, which is both interesting and instructive.

" The Greenland falcon should perhaps be considered impetuous rather than bold. It may often be seen dashing past dovecots and roofs of houses in the vain attempt to cause the pigeons to take wing. I have observed it equally unsuccessful in its endeavours to drive them from the top of a corn-stack far distant from home. They merely crouch the closer, waiting for an opportunity of making their escape. Upon one of these occasions the falcon, giving up the attempt, had flown seawards, disappearing from our sight immediately afterwards. Then the terrified pigeons, rising one or two at a time from their crouching position, began to look about them, and gradually recovering from their alarm, made off in a body for the dovecot, about 500 yards distant. Scarcely had they got fairly under way, when, to my astonishment, one of their number fell headlong to the earth, some distance in front of me, with such force as fairly to ricochet along the surface, the feathers flying in all directions. On running up I found it quite dead, with a deep gash the whole length of the back. On looking for the falcon, it

was discovered hurrying away towards Balta, and I never saw it again, although the pigeon was left on the spot where it fell and a careful watch was kept during the remainder of the day. I am told that it seldom or never strikes resting birds, although it will occasionally 'lift' them as well as rabbits. Not unfrequently a pigeon, when closely pressed, will take refuge within an open door (open windows are rarely seen in Shetland), the falcon pursuing it to the very threshold, sometimes even entering in its blind haste. I shall never forget the Babel of sounds which arose from the breakfasting farm-servants one fine Sunday morning, when a terrified pigeon dashed into the kitchen, with a beautiful Greenland falcon within a few inches of it. The robber, however, made his exit almost as rapidly as his entry, and the panting fugitive, after allowing itself to be taken up and fondled, was soon restored to liberty, without having received any injury. The flight is extremely rapid and vigorous, and, when exercised in the pursuit of prey, is, if possible, even more so than that of the peregrine; but it would be difficult indeed to decide which is the more graceful when endeavouring to rise above an active and vigilant quarry. The prey is usually carried off to some favourite spot previously selected for the purpose, such as a large rock or grassy knoll, from whence an extensive view in every direction is commanded. Surrounding one such knoll, which had been in use for about a week, I found the remains of rabbits, golden plovers, snipes, dunlins, ringed plovers, snow buntings, a kittiwake, a water rail, rock doves, and domestic pigeons. The latter must have been carried fully three miles, as there was no dovecot within the distance, and the pigeons were not given to ranging."—P. 13.

The lordly peregrine has, of course, invited and obtained Dr. Saxby's attention, and he seems to have studied its breeding habits with peculiar care; but in the case of this universally admired and once ubiquitous bird, now in the course of being sacrificed to the destructive wood pigeon, I feel that it is best to pass it by, as well as the remainder of the hawks, and proceed to the snowy owl, whose history has been amply illustrated and greatly enriched by the author's notes in the 'Zoologist.' This noble bird is essentially a bird of the north, occurring with equal frequency in the arctic regions of the Old and New Worlds. Its history is written in the 'Zoologist,' where will be found notes innumerable on its occurrences, plumage, migration, and nesting habits: these notes have been largely utilised by our publishing ornithologists, and I trust will continue to be for generations yet to come. Dr. Saxby has judiciously extracted and arranged his 'Zoologist' notes on this warlike and irascible bird, and has

prefaced them by the following observations previously unpublished.

“Guided by the observations of others, which, like my own, had been made only upon starving or severely wounded birds, it was my former impression that the snowy owl was docile and easily tamed. It has even been described as ‘an amiable owl.’ Experience has taught me otherwise, as will subsequently be shown. Robert Nicolson, a fisherman belonging to Unst, once kept a snowy owl for nearly two years. He had slightly wounded it while wandering among the hills near his own cottage, and he took it home with the hope of taming it; but he only partially succeeded, the bird never overcoming its natural fierceness, and showing especial animosity towards strangers. At first it was rather closely confined, but afterwards it was allowed the full run of the cottage, though not until the wings had been clipped. It used to sit in some dark corner during the day, giving but little notice of its presence; but as soon as all was quiet at night it would leave its hiding-place, and commence flapping and tumbling all about the cottage, upsetting everything which could by any possibility be upset, and tearing into rags anything in the form of clothing which had been incautiously left in the way. The cottage was under the same roof as the cow-house and barn, as is too generally the case in these islands, and after the owl had ranged through these for a few nights, no mice were to be seen or heard, although the place was swarming with them previously. Towards morning the bird gradually became quiet, and resumed its state of comparative inactivity until the following evening. It was fed upon rabbits and birds, but never seemed to require drink. Ducks and fowls were never safe when the door was open. Sometimes a living hooded crow was thrown down to it, and then a fierce encounter was sure to follow, but it was seldom of long duration,—sooner or later the head of the crow would be lying in one place and the body in another. Once the owl tried to kill a pig about a month old, but was detected in time; and upon another occasion it had the audacity to pounce upon a full-grown cat. It immediately attempted to bite off the head, and probably would have succeeded if the owner had not come to the rescue, for the cat was almost powerless in its grasp. The owl often escaped, and was as often recaptured, until at last Nicolson, having become tired of stumbling over the rough ground in pursuit, resolved next time to leave it to its fate, and accordingly next time it escaped no exertions were made to recover it. It remained in the hills for upwards of two months, at the end of which time it was caught upon a low wall near the cottage, and was once more brought home. But there was no occasion to keep the door closed. The bird, having probably become aware of the inconvenience of being compelled to provide its own meals, never again attempted to escape, nor could it be induced by any means to

leave the premises. Few pets die a natural death, and this unfortunate bird proved no exception to the rule; for one night it got into the fire, and, before it could extricate itself, sustained such severe injury that it died very shortly afterwards. Another owl of the same species, after being kept for several months, died after eating a small piece of salt fish. One kept by myself died at the end of eighteen months, still as untameable and—except towards myself—as fierce as upon the day of his capture. This bird, having been slightly wounded by Nicolson, was brought to me on the 21st June, 1864; and although its endeavours to escape ceased in a few hours, it was not in the slightest degree subdued, but was ready with bill and claw for the first hand which happened to approach within reach. My notes upon this individual being much scattered, I here collect them in a more convenient form, the greater part having already appeared in the pages of the ‘Zoologist.’—P. 44.

The constant clashing of hypothesis and fact, of what Nature ought to do and what she does, will never receive a more apt illustration than in the natural history of the redwing. I shall not think of encumbering this notice by repeating the record that has already appeared in these pages of the redwing nesting at Maentwrog, in North Wales; but the editor of the new edition of Yarrell (vol. i. p. 269) has a comment on the record, which a sense of justice compels me to quote, and to accompany with Mr. Saxby’s reply. The passage in Yarrell is this:—“Cases, though to be regarded with doubt, have also been recorded of its breeding in this island [Great Britain]; of these perhaps the best authenticated is that mentioned by Dr. Saxby, who says (Zool. p. 7427) that in May, 1855, at Maentwrog, in North Wales, he found a redwing’s nest with four eggs, upon which he repeatedly saw the bird.” No fact throughout Yarrell’s invaluable volumes is more clearly stated than this, and I cannot see on what plea it can be called in question. Here is the Rev. S. H. Saxby’s comment:—

“[I shall perhaps be exercising a wise discretion in here departing for once from the strictness with which these pages are confined to observations made in Shetland, and venturing a remark on the assertion in the new edition of Yarrell’s ‘British Birds,’ that the recorded cases of the redwing’s breeding in Great Britain are to be regarded with doubt. There cannot be the shadow of a question as to the absolute soundness of the case there merely alluded to as perhaps the best authenticated, namely, the detection of the nest by Dr. Saxby in May, 1855, in North Wales. It was under his daily observation from May 12th to June 5th, when at last it was cut out of the bay-tree in which it was built, the birds having forsaken it, all his vigilance

in the hope of seeing young redwings British born being frustrated. One of the eggs then taken is on the table as I write, together with the minutely detailed record in the pages of my brother's note-book for the year alluded to. I well remember the anxious care taken to guard the birds from intrusion, and the deep interest felt in the unprecedented occurrence by the old shepherd and the few others who were in the secret.—*Ed.*]"—P. 64.

The song of the wheatear, or "wheat-rumped stonechat," as Macgillivray is pleased to call it, is described by that erudite, indefatigable and fanciful inventor of new names, as "a short, lively, and pleasantly modulated warble, which it performs sometimes when perched on a rock, wall or turf, but more frequently while hovering at a small height in the air, and often in the midst of its short flights when pursued or disturbed."—Vol. ii. p. 293. Sweet says that in confinement "the wheatear is continually in song, by night as well as by day, and that its winter song is best and most varied;" and Mr. Yarrell observes, in addition, that "the male sings prettily, but not loud, often when hovering on the wing either near his nest or his partner." This, however, seems little more than a copy of Macgillivray; indeed Yarrell's work is remarkably bald as regards the song of birds, and he seems to have had a practical acquaintance with very few.

Dr. Saxby regards the "steinkle," or wheatear, with great favour, and tells us of one of its accomplishments, that of a mimic, which is new to me: this I attribute rather to want of attention, or I should undoubtedly have been able to have borne my testimony also to the excellence of its mimetic powers, for I have often, as I supposed, heard the familiar wail of the peewit mixed with the *peep*, *chack*, *chack* of the wheatear, wherever the latter is most abundant, and have taken the mimic for the mimicked, for whom I have often looked in vain. The wheatear is a bird I dearly love, and the very sight of its effigy in Yarrell reminds me of the breezy downs which are its favourite haunts. In Shetland it is a regular and extremely abundant visitor; it arrives in April, and remains until the beginning of October; the male comes first, and after a few days the female, at first sparingly, but in a few hours the hills and valleys are covered with them as if by magic. But now for its vocal powers:—

"Having recently made a careful search in the whole of my small collection of ornithological books, I am greatly perplexed to find that although frequent mention occurs of the song itself no allusion whatever is made to the marvellous power possessed by the wheatear of imitating the

notes of other species. For example, one day in May, 1866, upon a hill near Snarravre, a fine male wheatear sitting upon a large stone, after entertaining me for awhile with the cry of the ringed plover, suddenly went off into an exceedingly good attempt at that of the lapwing; but soon afterwards, having inadvertently destroyed the whole effect by a ludicrous mixture of the two, it stopped for a short time, and then began a monotonous 'peewit, peewit,' which continued as long as I remained within hearing. Upon very many occasions I have heard the wheatear successfully imitate the notes of the following birds:—House sparrow, sky lark (part of song), common bunting, mountain linnet, peewit, golden plover, ringed plover, redshank, oystercatcher, and herring gull. So complete is the deception that when the bird has been out of sight I have many times been thoroughly taken in. One April morning, hearing, as I thought, the cry of a redshank, I was preparing to follow up, when to my surprise I discovered that the notes proceeded from a wheatear, the first of the season, perched upon a stone not many yards distant."—P. 68.

My technical reader must bear with me and with another little bird that is as great a favourite of mine as the wheatear, and one that I have been more successful in transferring to my bird-cage, for I have always failed with the wheatear; I mean the snow bunting. At the present writing I have two pairs in apparently the most vigorous health and most perfect plumage, having just completed their autumnal moult; and although I cannot call them "familiar," like siskins, canaries, bullfinches, and some others, they are sufficiently reconciled to confinement to bear it without exhibiting any symptoms of a desire to escape, and sufficiently also to allow of my making any observations I please on their habits and manners. How different they are when caged from what they are in a state of unrestrained freedom we must all be ready to admit; but at the same time how infinitely more attractive than when skinned, and mounted, and arranged in a museum. The chamber ornithologist conceded much to the humble student of Nature when he consented to forego the wiring, the posturing, the painting, and the sealing-waxing, and contented himself with skinning, and drying, and filling loosely with cotton-wool. I scarcely see how he can go further than this at present; but still the place for study is the field, and the weapon, if he require one, the telescope, and not the gun. Snow buntings are not the most patient of prisoners, and yet will reveal all manner of agreeable character if left in peace: if you desire to study them with advantage you must preserve utter stillness, convert yourself into a statue, and then they will go on with

their ordinary avocations. But now let us observe these delicately tinted yet hardy little creatures in the open, when captivity is a state of which they are in happy ignorance.

“In rough or wet weather they are not often seen upon the wing; but, unlike many other birds, they do not usually seek enclosed feeding grounds for the sake of shelter from the wind. During the heaviest gales I have watched them closely, and have then seen that the stubble afforded them quite as much protection as they cared for. At such times they are unwilling to rise, and often permit a very near approach; but when in the spring a severe storm drives them from the open grounds, they gather in very large flocks and assemble in the fields, the walls of which afford them protection and the means of feeding in peace. In March, 1871, I met with the largest assemblage of snow buntings I have ever seen, all under shelter of a four-foot wall, and certainly covering some acres of ground. A very heavy sleety gale was blowing from the north-east, and wishing to obtain even a partial shelter, I too kept to the lee-side, walking through the midst of the broad line of birds. So unwilling were they to rise that I could have reached many of them with my stick, and as I advanced the sight became perfectly confusing, the birds fluttering up as I approached and immediately settling in front, behind and upon either side, never venturing to rise as high as the top of the wall. It seemed as though I were literally wading through them, the continual shimmering of white producing an effect altogether indescribable. In fine weather they are more disposed for flight, and then it is that their well-known notes may be heard far overhead almost uninterruptedly from sunrise until after sunset. I have only upon one occasion heard them late at night, and that was at about eleven o'clock one clear starlight night in autumn. Even in open weather one or two may occasionally be seen upon a stack of oats; but it is only during heavy snow or severe frost that they visit the farmyard in any great numbers. When engaged among the stubble they are not easily perceived, often affording the first indication of their presence by rising suddenly within a few paces of the intruder. When thus disturbed a few nearly always remain upon the ground; but the main body, rising in a compact mass, fly off to some quiet spot if they have frequently been molested. If otherwise, they are nearly sure to return to the same field after the cause of alarm has disappeared. They seldom alight with the first intention. The flock descends with a gradual sweep, suddenly contracts its dimensions as the ground is approached, wheels rapidly when within a few feet of the surface, and rising again, flies off to a considerable distance before venturing to return, and these manœuvres may be repeated a score of times before it will settle upon the chosen spot. When the birds have finally resolved to alight, the flock wheels repeatedly and rapidly, then dropping rather suddenly.

"Snow buntings upon the wing keep up a constant chirping, and occasionally a sudden jarring sound may be heard; and as this is usually followed by an immediate deviation of the flock from its course, it has been thought by some observers to be nothing less than a word of command; but I have been able to account for it almost completely to my satisfaction. On watching with a little patience, any person may observe that simultaneously with the utterance of the peculiar sound, one bird makes a rapid dart towards a near neighbour, and the two in their excitement forgetting to direct their course aright depart from the common track, thus leading the whole flock astray; for birds upon the wing are always ready to imitate any sudden movement upon the part of an object near them, whether it be a stone thrown among them or one of their number falling to the ground. That the note in question is sometimes at least one of anger I have repeatedly observed when two of the birds have been quarrelling over their food; but it must also have some other meaning, for it is uttered in chorus by the whole flock during the performance of those rapid wheels close to the surface, which I have attempted to describe above. Seen against a dark hill-side or a lowering sky, a flock of these birds presents an exceedingly beautiful appearance, and it may then be seen how aptly the term 'snow-flake' has been applied to the species. I am acquainted with no more pleasing combination of sight and sound than that afforded when a cloud of these birds, backed by a dark gray sky, descends as it were in a shower to the ground to the music of their own sweet tinkling notes."—P. 91.

The brambling, like many other species, has become more abundant of late years, in consequence of the numerous, and in many instances successful, attempts to plant these infertile regions with trees. The chaffinch was formerly a rare winter visitant, but is now plentiful wherever there are gardens to attract it; they arrive in considerable flocks in September, October, and the beginning of November, and usually with an easterly wind: the males greatly preponderate in number, and in May, June and July, males *only* are seen. Both species are regular migrants, and the brambling is particularly distinguished on its arrival by a faded and dingy appearance. Dr. Saxby has caught and caged bramblings, but they seldom lived more than a few days, so incessant and violent were their attempts to escape, and so pertinaciously they refused every kind of food that was offered them. It is different here in London; they are among the most quiet as well as most greedy of cage-birds, eating with voracity hemp-seed, canary, oats, bread, bread-and-milk sop, plaintain, chickweed, groundsel, spiders, ants' eggs, indeed almost every kind of food that I can procure: they

are certainly of no value as song-birds, but that is of little consequence, for the naturalist rarely values his birds by the noise they make. In a wild state as well as in captivity they roost, by preference, at a considerable elevation from the ground, but on one occasion when Dr. Saxby was belated on the hill-side, amid complete darkness and sleety rain, having stopped to trim his lantern under shelter of a wall, his attention was attracted by a twittering to which his ear was unaccustomed. On looking over the wall, he continues:—

“I saw to my astonishment that the ground was thickly covered, in some parts literally paved, with bramblings and chaffinches. The sight was a singular one indeed; the poor benighted travellers had chosen the only shelter that was to be had, and seemed to be worn out with fatigue, not one of them attempting flight, or even moving more than its head, which always followed every movement of the lantern. I then left them, envying them their comfortable quarters, and early next morning had the pleasure of seeing a large flock, probably the same.”—P. 98.

Of course it would have been impossible to ignore the *pros* and *cons* of the great sparrow question; but Dr. Saxby touches it very lightly. Scotland and all its isles are smarting under the plague of wood pigeons, whose complete colonisation has been achieved by the extermination of the hawks. When a Londoner, some years ago, recommended that the hawks should be unmolested, the farmers scoffed at his folly, and triumphantly inquired which of the two was likely to know best, the sportsman, the ground-owner and farmer, accustomed to the heaths and the hills from childhood, or the cockney writing in a garret in the Strand. The universal verdict was against the cockney, and the Scotchman persisted in his suicidal course. This is as it should be; experience is the best schoolmaster, far better than all theoretical homilies. It seems that in Shetland the sparrow appears as a depredator of rather a different kind: there is no wheat, but there are oats and there is barley; and there seems to have been a futile scheme for raising gooseberries. The sparrow takes toll of barley and oats.

“I think this is the only crime we can lay to its charge, except that it frustrates every attempt to rear gooseberries, for though the blossom forms well, no sooner is the fruit the size of a mustard-seed than the sparrows devour it, seldom leaving as many as a dozen berries among as many bushes.

“It would be futile to here enter into the controversy as to the expediency of exterminating or encouraging certain species of birds. Nothing but the temperate and deliberate consideration of an accumulation of well-authenticated facts will ever solve the difficulty. The following, however, seems worthy of record. About fifteen years ago the little village of Dale, in Unst, was much infested with sparrows, which, breeding abundantly in every possible situation, yearly assembled in large flocks at the time of the ripening of the corn. A newly arrived Methodist preacher, a Londoner, observing this, at once proceeded to explain to the inhabitants the nature of ‘sparrow clubs,’ and to urge upon them the necessity of losing no time in exterminating the whole of the mischievous race by every possible means. So implicitly were his instructions obeyed that for many successive years scarcely a grain of corn was touched, and the villagers were lost in admiration at the success of the experiment. Some time after his departure, on chancing to inquire how it happened that at Dale the potato crop was always a failure, although formerly the opposite was the case, I was informed that of late years ‘the Lord had sent a storie’ (worm) which destroyed the whole crop. Coupling this failure with the absence of sparrows, I asked and even entreated the people to try the experiment of allowing the poor birds to remain unmolested; but the proposal was merely received with the usual amount of head-shaking, and with the argument, which I did not attempt to refute, that a sparrow had never been seen to pick up a ‘storie,’ but that scores might be noticed upon any harvest day destroying the corn. Whether or not the people had become tired of persecuting the birds, I cannot say, but from thenceforward the sparrows were allowed to breed without molestation; and within two years from that time the potato crop was excellent, and it has continued so ever since, nor do the people complain of a smaller quantity of corn than during the time of the persecution.”—P. 99.

The twite, or mountain linnet, is a great favourite of mine. It is cheerful, contented, active, neat and clean, and withal it is a comparative stranger in the land of cockayne; therefore every scrap of intelligence we can gain respecting him is acceptable—indeed is received with gratitude. In October, 1863, Mr. Harting saw a solitary specimen on Harrow Weald Common, and in the following October several were taken near Kingsbury Reservoir. To see the twite in its native wilds, to watch it building its nest, to note its days of egg-laying, and to learn how it deports itself in its island home, is not a pleasure to be enjoyed by us dwellers in cities, and is reserved for those who are able to breathe the mountain air when and where they please. Dr. Saxby has enjoyed this privilege, and has enabled us to form a very good idea of the private life and domestic arrangements of the twite.

“One very favourite situation for the nest is under a long strip of turf which has been nearly reversed by the plough. In such a situation I once found the commencement of a nest, and derived much interest from watching the progress of the work. When one of the birds disclosed to me the site chosen for its future habitation, by flying out suddenly at my feet, I could perceive nothing more than a slight hollow which had been scraped beneath the turf, and although I frequently visited the spot in the course of the day, nothing more was seen of the bird until about twenty hours afterwards, when the pair began placing a number of fibrous roots in front in the form of a half circle, the back part of the cavity being left untouched. In a few hours' time some stalks of plants were added, and from four o'clock in the afternoon until noon next day the birds disappeared. They next laid the foundation of the other half of the circle, continuing steadily at their task until the structure was equal in height all round. They now appeared more eager to proceed, working so diligently that by the evening of the fourth day the mass of roots, grass and stalks of plants formed a perfectly circular wall an inch and a half in height and about two inches in thickness, somewhat loose and irregular upon the outside, but with the inside neatly interwoven and sloping rather suddenly to the bare patch of ground enclosed. On the morning of the fifth day I observed a few feathers upon the ground in the centre, and the number rapidly increased until the sides were covered more than half-way towards the brim; in the evening the feathers were almost concealed by a quantity of cow's hair, among which a little wool was intermingled. More work was done on that day than upon any other. Having often found rabbit's fur in the nest of the twite, I now procured a quantity of that material and strewed it over the ground, not too near lest it might cause suspicion. Although it was soon discovered, the birds were not quite contented, using it rather sparingly, and working it into a felt-like mass with wool and the hair of cows and ponies. This process appeared to be one of difficulty and to require great care, for it was not before the evening of the eighth day that the task was completed, the brim of the cavity being by that time neatly finished off with a few long black horse-hairs, and measuring exactly two inches and a quarter in diameter. On the ninth day the birds were not to be seen, but by the morning of the tenth day the first egg was laid. Every succeeding morning I found an additional egg until five had been laid, and the female began to sit. It is seldom that the lining of the nest touches the ground, as it did in this instance, a layer of fibrous roots, &c., being generally interspersed. I observed that the thickness of the lower part of the nest is greatest in those specimens which have been found in bushes far above the ground.”—P. 109.

The raven is another species which we know only as a captive. Mr. Harting, who is our best authority on London birds, does not

record that he has ever seen one, but quotes Mr. Jesse's 'Gleanings,' for a record of a pair having once bred in Hyde Park, a statement that I think must be received with caution. How different is the state of things in Shetland, where the raven is a migrant as well as resident: it is seen all the year round, but large numbers arrive every October in addition to those which are bred on the island. They feed on insects as well as carrion, and as many as forty have been observed within the space of a few acres, searching diligently for those larvæ of *Lepidoptera* which feed on the roots of grass; but their chief food is certainly carrion, and a great attraction is the offal resulting from the annual slaughter of cattle in November. This, however, is not invariably the case.

"Sometimes they arrive without any apparent reason, but an unusual abundance of carrion is sure, by some mysterious means, to attract them from distant parts. A notable instance of this occurred during the third week of April, 1864, when a number of whales were driven ashore at Uyea Sound, and having been 'flinched,' were left to decay above high-water mark. Many of the ravens, if not most of them, must have been sitting upon their eggs at that time, and it therefore appears rather unaccountable that as night approached a considerable number of the gorged birds would flap across to the island of Uyea, where they would remain in safety until daylight enabled them to return to their horrid feast. The flock was continually added to by new arrivals, some of them coming to procure choice morsels either for their young or for their sitting mates, and the numbers gradually increased until the 18th of June, after which day, the food being nearly all gone, the crowd of birds speedily began to lessen. On visiting the island of Uyea one evening about that time I was astonished to observe the edge of the cliff perfectly blackened with the ravens preparing to roost among the ledges. I heard several estimates of their number, but after making considerable allowance for exaggeration, felt satisfied that eight hundred would be very near the mark. Walking along the cliffs after they had retired, and shouting to bring them out, my brother-in-law fired and killed three at one shot as they flew from beneath—a previously unheard-of feat."—P. 122.

There is something horribly repulsive in the character of the raven, his hand seems lifted against every one and against every animal living or dead. He kills and devours ducks and poultry; the half-starved and enfeebled sheep he seems to consider his lawful prey: with his powerful beak he batters their heads, picks out their eyes, and feasts on the reeking entrails. The Shetland pony often shares the same fate, and calves dropped away from

the homestead are certain to perish by his murderous assaults. We cannot wonder that in turn every one who has the power is his assailant: he has not a single friend, no one to palliate his misdeeds: even Dr. Saxby, the enthusiastic naturalist, compassed his destruction on all occasions; and well he might, for certainly the raven only lacked the opportunity to do the same by him.

“Some years ago I accidentally discovered a very successful method of shooting these birds, the only objection to it being the expenditure of time which it occasions. I was lying upon the heather, keeping my gun beneath me to shelter it from a slight shower, when five ravens appeared in the distance, and, soon catching sight of me, began hovering and croaking overhead. Their curiosity was evidently excited, and they showed every desire to cultivate a closer acquaintance, but though I stirred neither hand nor foot, about half an hour passed without any further advance upon their part. Presently the profound truth dawned upon me that dead animals never move their eyes, and accordingly, to make the resemblance as complete as possible, I closed my own. Very shortly afterwards the birds began to wheel nearer, croaking louder than before, and occasionally alighting upon a distant hillock; and at last when they came within easy range I started up suddenly and killed two. Upon several other occasions I have shot them in a similar manner; but they would never come within reach either when the gun was exposed to view or when my eyes were open. Although so cautious in their dealings with mankind, they will fearlessly approach a pony, even when it is giving evident signs of life.”—P. 126.

A dog and raven on a Shetland farm had long been sworn enemies; the raven was the aggressor; he continually annoyed the dog, and evidently trusting to his wings as a ready means of escape, seemed to taunt the dog with his inability to avenge the insult: the dog, after carrying on the war of words,—I mean growling, and snarling, and barking,—at length appeared to relinquish the hope of subduing his enemy, and therefore pretended utterly to disregard him.

“Seemingly in despair of ever being able to grapple with his enemy, the dog could never again be enticed to forget his own want of wings, and consequently the raven grew bolder and bolder, hopping along almost beneath his very nose, and sometimes even striking him with its claws. One day, however, as the dog was passing along a low turf-wall, the raven thought fit to repeat the performance, keeping most provokingly a little in advance, and occasionally varying the amusement with a croak or a sly pounce. The dog trotted along as briskly as usual, looking neither to the

right nor to the left. Then the raven, making a short circuit, again assailed him from above, and, passing over his head, was about to alight deliberately upon the wall, when the dog, making a mighty bound forward, seized his enemy by the wing, and tore him literally to shreds."—P. 127.

EDWARD NEWMAN.

(To be continued.)

Notes on a Mongoose.

By JOSEPH SMITH, Esq., M.R.C.S., F.L.S., &c.

(Communicated by W. R. Hughes, Esq.)

IF you remember, I promised to send you a report of our much admired little favourite Jenny; and so, to begin in the orthodox fashion, will say, Jenny, or rather our moongus, of the family Viverridæ, named, according to naturalists, *Herpestes griseus* (and here, by the way of remark, if you will allow me to make an abominably ungrammatical pun, I can safely say *Her(a)pestis*), was born in India, carried to this island by a sailor, presented to a barber, who, to speak candidly, I believe was much alarmed at our little friend, and sold to me, with her cage, at the low price of one pound. When she came into our possession, now upwards of two years ago, I am free to confess she caused the household no small degree of concern, lest she might at some inopportune moment escape from her domicile, warily reach our beds at night, while we, unconscious of our fate, rocked in balmy sleep, should be quietly bled to death, as per the vampyre of old. By degrees, however, we became more familiar with our new acquisition, commencing at first, by dint of great care, to place a small collar round her neck, and lead her about with a string attached; but finding many symptoms of docility manifested, one or another would pick her up, stroke her head, and at last she was allowed to roam wherever she pleased.

Her colour, as you saw, is grayish brown, the hairs on the back very harsh, not sleek, as you would from appearance have judged; the head is smooth, nose pointed,—in fact, not at all unlike the ferret, save the tail, which is long and bushy (when excited), giving you an idea of the hen pheasant's tail; the feet are small, armed with powerful claws, and covered with small dark brown hairs; the ears short and rounded; the hairs have alternate bands, not altogether unlike the badger. Her length from end of nose to tip of tail

is twenty-eight inches. The eyes are brown. In her native country she is renowned as a snake-killer, and popular error says that after killing a snake she would eat of a plant called mungo root (*Ophoriza Mungos*) to destroy any toxic effects; but this is extremely doubtful.

Of her domestic attractions it is impossible to speak too highly. Very cleanly in her habits, remarkably graceful in her movements, and, unless kept confined for several days, perfectly free from smell, she is at once, in her best behaviour, a pet of all. Very like a kitten in her antics, she will play with a ball between her paws, rolling over and over again, sometimes appearing as if she was endeavouring to turn herself inside out, but instantly righting. When at evening my wife is sewing, she will empty her work-basket, delighted to get a reel of cotton, which she most energetically unwinds. Should my wife be writing, Jenny will steal to her face, and playfully lay hold of her pen or bite her nose. Most gentle in ways, she has never bitten any one in the house. My little boy pulls her indiscriminately about; in fact, of all the pets I have kept, Jenny carries the prize for amusement. One trait in her character is very interesting; should no saucer of milk or water be at hand, she will go to the water-bottle, stand upon the neck with her fore paws, pushing one down the neck inside until she reaches the water, then forms the foot into a scoop, withdrawing it when filled, and lapping up the contents, and so on until satisfied. When the tobacco-jar is on the table she will scrape out the whole of the contents, spreading it on the cloth. When bed-time comes she will decamp, and call as much as you may she will not answer, but when you get into bed you will find a round ball carefully tucked up in the blanket, and that is our little acquaintance Jenny. She will not patronize one bed, but selects the most comfortable.

So much for her good behaviour; but there are two sides to most questions, so if you will permit, and have patience to read, I will tell you her worst propensities. Jenny is *par excellence* the most stealthy thief I ever met with—nothing in any way get-at-able is safe. If when at dinner, and she is loose, you do not keep a keen eye on your plate, whilst you are handing up a morsel to your own mouth, the remainder of your meat vanishes, and when she has it, like a kitten, her tail becomes immediately double or treble its size, and, amidst much swearing, she devours what an instant before you had fondly hoped was your own. Turn your

back for an instant, and anything she can lay hold upon flies. Eggs are especially good in her sight—butter, bread, in short, almost everything edible. Her love of investigation is truly appalling; only a few days since a crash was heard, and no less than four of our choicest chimney ornaments had come to grief. In the fern-house it is not uncommon to find a choice specimen uprooted—holes scratched in the garden at the root of a favourite plant. Occasionally she visits our neighbours, on one occasion carrying off a cooked rabbit, and causing the utmost consternation.

I have said she is a thief; at the same time she is a most graceful beggar, sitting up in a most captivating manner, and mewing not unlike a bronchitic cat.

Of her destructive properties I can testify from repeated observation. Rats she kills very quickly, but I am bound to say in a sneaking manner; walking up to them, she appears to be making friends, when instantly she grabs the back of the neck, and all is over. Snakes she kills instantly, and with a rapidity truly wonderful. Mice she has a contempt for, killing them and eating at once. The snake she seizes at the back of the head: I should like to see her with a very large one. Small birds she is fond of, eating them ravenously.

I cannot take leave of our little friend without once more alluding to her affectionate manner, when sitting on my knees, playing with my watch-chain, and playfully biting at my fingers to make me play; I can forgive her wickedness, when I see her pretty antics and perfectly harmless demeanour. Long may she live.

JOSEPH SMITH.

43, David Place, Jersey,
September 3, 1874.

Ornithological Notes from Norfolk.

By H. STEVENSON, Esq., F.L.S.

(Continued from S. S. 3865.)

JANUARY, 1874.

For the last fifteen years I have never known such a dearth of ornithological occurrences, worth recording, as at the beginning of the present year, the extreme mildness of the weather affording

nothing more remarkable than the too early "indications of spring"—the pairing and song, in the middle of January, of thrushes, blackbirds and robins, and the appearance of violets and primroses, as if the winter was fairly over. The snow buntings, so abundant on our coast in November and December (S. S. 3862), still frequented the same localities in diminished flocks, and at Yarmouth were at one time so numerous that the bird-catchers netted them for "trap" shooting in place of sparrows. Towards the end of the month I observed, in this neighbourhood, large flocks of small finches, linnets, redpolls, &c., feeding on the stubbles, but "here to-day and gone to-morrow," and notwithstanding the mildness of the weather, the usual bunches of *cock* greenfinches appeared in the market, showing the annual and, as to sex, the separate migration of this species, at this time of year.

FEBRUARY.

A few severe frosts and some snow in the early part of the month brought some fowl and snipe into our markets, but nothing of any rarity. On Wroxham Broad the abundance of *Anacharis alsinastrium* attracted an unusual number of ducks, chiefly mallard and teal, and drew the coots from surrounding waters in considerable quantities to feed on this favourite but troublesome weed. On the 5th a bittern, an unusually small bird, was killed at Stalham, and on the 8th I again observed immense flocks of greenfinches, linnets and other small birds, evidently "on the move," in advance of the snow and sharp frosts, which commenced the day after and lasted up to the 13th. A female goldeneye, a few pochards, teal and mallard, with bunches of snipes, green and golden plovers, and a solitary magpie (a scarce species now in Norfolk) were the only birds worth notice which that short spell of hard weather brought to our game-dealers; but a very fine old male goosander was shot about this time on Breydon. Fieldfares and redwings were extremely abundant during the frost, and our birdstuffers received several kingfishers, goldencrested wrens, and three or four great crested grebes; but whether the latter were shot on the coast or on inland waters I could not ascertain. About the middle of the month some two dozen bullfinches were brought alive to a bird-fancier in this city, said to have been taken in the neighbourhood of North-Walsham. A pied hen of this species, very prettily marked, was sent to Mr. Gunn to be stuffed about the same time. Another

bittern was shot at Catfield in the last week of the month. On the 28th hooded crows and rooks were observed near Cromer, apparently commencing to leave and cross the sea.

MARCH.

This month, like its predecessors, commenced with mild weather, till a batch of snow and frost set in from the 9th to the 13th, trying alike to the advanced vegetation of our gardens and shrubberies and the nursery arrangements of the early nesting birds. A hen sparrow, caught for "trap" shooting in the first week of March, had eggs ready for exclusion, and on the 29th I saw a young starling in its first gray plumage, without a single spot to indicate that it might have been a late-hatched one of the previous year. Male chaffinches were in full song at the beginning of the month, at which time the bird-catchers were netting greenfinches and yellow-hammers in large numbers, as well as sparrows, and the barbarity of "trap" shooting throughout the spring and summer months, as practised in this part of the county, is sufficiently evidenced by the statement of a local birdcatcher, that at this time of year he not unfrequently finds the sparrows netted for one day's shooting to be almost all males, feeding together as I have repeatedly observed them in my own garden, whilst the hens are sitting. Can nothing be done to stop this wanton destruction of bird-life at a season when, by supplying their nestlings with insect-food, they are doing the greatest possible amount of good to the farmer and gardener? To include them in the Wild Birds Protection Act, as Mr. Auberon Herbert and his friends have suggested, would be simply a farce, as no one would dream of prosecuting when a *reprimand* only, with payment of costs, is the penalty for a first offence, and a fine, not exceeding five shillings, *including costs*, the penalty for subsequent convictions. The roughlegged buzzard shot at Burgh, near Yarmouth, on the 4th, and the common buzzard at Berghapton on the 20th, as recorded by Mr. Gunn (S. S. 4117), and a peregrine falcon seen at Northrepps on the 1st, appear to have been the rarest occurrences of the month.

APRIL.

Blue Tits.—I have watched several of these birds, frequenting the silver birch trees in my garden, busily engaged upon the catkins which, at this time, hang in profusion, performing the most

wonderful gymnastics in their eager search after some kind of insect-food; at least such I presume to be their object, as in flitting from one catkin to another not one in ten occupies their attention for more than an instant, though a prolonged stay on some seems to reward their exertions.

Spring Migrants.—The following dates of arrival of spring visitants have been chiefly supplied me by Mr. J. H. Gurney from the neighbourhood of Cromer, and by a few other authorities from different parts of the county:—

April 3rd. Chiffchaff at Northrepps. 4th and 5th. Nightingale first heard in two localities near Norwich, an extremely early date; several in song near the city on the 6th, 7th and 8th. In the late Mr. Marsham's table of "Indications of Spring," as made from his own observations during a period of nearly sixty years, at Stratton Strawless, near Norwich, under the head of "Nightingale sings," the earliest date is April 7, 1752, the latest May 19, 1792, the medium time being April 28, 1784, a difference of forty-two days being observed in fifty-nine years.

10th. Ring ouzel and willow warbler at Northrepps.

11th. Blackcap at Keswick, near Norwich.

13th. Cuckoo seen at Stanfield.

19th. Wryneck at Keswick; at Earlham on the 21st. Young rooks calling in the nest.

20th. Hobby seen at Keswick.

21st. Swallows (two) seen at Keswick, and five at Northrepps. One seen at Earlham, for the first time, on the same day.

22nd. Wood Warbler heard at Northrepps.

27th. Grasshopper warblers heard on Hoveton Broad. Turtle dove first seen.

28th. Common whitethroat at Northrepps. Redstart near Norwich. Young robins left a nest in my garden, and were fed by the old ones on the grass plot. Young blackbirds still in their nest.

Sanderling.—A specimen sent up from Yarmouth on the 10th was still in perfect winter plumage, not a trace of red appearing on any of the feathers.

Herons Nesting.—On the 21st of April I visited the Earlham heronry near Norwich, and was glad to find a numerous colony, some twenty-eight or thirty nests being occupied. Most of the birds rose from the trees as I entered the plantation, but a few

remained on their nests, evidently sitting close, and empty eggshells here and there on the ground showed that some nestlings were hatched. With the help of a powerful glass I had a good view of the sitting birds as they crouched down, with their long necks thrown back between their shoulders and their beaks and tails projecting from and resting on their platform of twigs. Where their long legs were stowed away so as not to interfere with either eggs or young seemed a mystery, but they were most unquestionably in the nest, and not, as I have heard asserted to be the custom of these birds, protruded through the nest or over the sides. An entire nest from this heronry, preserved in a glass case in the hall, contains four nestlings, all differing in size and age, like young hawks. A pair of herons established themselves this year in Keswick rookery and brought off their young ones, for the first time since, about forty-five years ago, they quitted that ancient stronghold for Earlham and other neighbouring localities, the underwood there being somewhat thoughtlessly burnt during the breeding season, a liberty which they resented by seeking fresh quarters the following spring.

Lesser Redpoll.—Mr. Purdy, of Aylsham, sent me on the 27th a beautiful little nest of this species, which had been built in a yew tree, and to which, entangled in a horse-hair that had been woven into the structure, was suspended an unfortunate redpoll, too securely fastened to effect its release. I cannot endorse Mr. Gunn's remark (Zool. S. S. 4117), that the lesser redpoll "is *becoming* quite a resident in Norfolk," since, although I have not known of its nesting so near this city as in the instance recorded by him, yet more than twenty years ago I knew of its breeding in some of the localities he names, and in others as well. Mr. Purdy tells me he has several pairs nesting in a plantation near his house in spruce-fir trees.

Common Buzzard.—An immature specimen shot at Thwaite on the 4th.

Shoveller and Garganey.—Saw a fine male shoveller on Hoveton Broad on the 27th, and several garganeys, which nest there every year.

Blackheaded Gulls, Grebes, &c.—The gulls, which for some years past have located themselves on Hoveton Broad, were more than usually numerous this spring, and were laying freely at the time I visited the Broad on the 27th. Six pairs of great crested

grebes are said to have returned to the Broad, and I saw one nest with the eggs hard set upon. The coots did not seem to have nested so early as usual, their eggs, unlike the waterhens', being all fresh laid. Lapwings and snipes were pretty numerous on the surrounding marshes, with several pairs of redshanks. A snipe's nest found in a high grassy tussock had the eggs very hard set.

Wild Duck's Nest.—The keeper at Hempstead, near Holt, informed Mr. Gurney that a brood of young wild ducks were hatched under their own mother on the 7th of April, the earliest date he had known of.

MAY.

Spring Migrants.—May 2nd. Young rooks out, and generally so by the 9th.

7th. Goatsucker and turtle dove seen at Northrepps. Young blackbirds on the wing.

9th. Redbacked shrike seen at Northrepps.

23rd. Spotted flycatcher seen at Northrepps.

25th. Swifts seen in Norwich, but not again for several days.

30th. Swifts plentiful at Cromer, but some are said to have made their appearance there nearly three weeks before and to have disappeared again: none were remarked at their usual haunts in Cromer and Southrepps church-steeple, either on the 28th or 29th; but at Aylsham, near Cromer, they were observed on the 23rd.

Peregrine Falcon and Hobby.—On the 14th a peregrine was seen at Northrepps, and a hobby, apparently a female, on the 13th. On the 26th a male hobby, a young bird of last year, in change of plumage, was shot at Northrepps, and in its stomach were found remains of beetles and of a small bird.

Nightingale.—Mr. Gurney was informed, on good authority, this month, that a man who had set a steel trap in his garden at Keswick for rats, without any bait, caught two nightingales in succession, probably attracted by the fresh mould spread over the trap.

Common Dotterel.—A bird in the immature plumage of last year was shot at Scottow on the 6th.

Waders on Breydon.—The usual flocks of migratory waders appeared on the Breydon "muds" about the second week in May, and, as a further evidence that the Wild Birds Protection Act is a "dead letter," owing to the absurd alterations made in its penal clauses by the *quasi* friends of the "little bird," I may state that

some of the most perfect specimens of knots, sanderlings, bartailed godwits, gray plovers and turnstones, in full summer plumage, that have been killed in this county for some years, were shot on Breydon this spring, and passed at once into private hands, to the disgust of those local collectors who, respecting the Act, notwithstanding its weak points, have *not* encouraged local gunners to break the law.

Pied Flycatcher.—A pair were shot, about the 16th, in the "North End" gardens, at Yarmouth; and, about the 25th, a fine adult male at Gunton, near Lowestoft, on the same part of the coast.

Shoveller and Garganey.—Both species have appeared, and I believe nested, on Surlingham Broad this summer; of the latter some three or four pairs annually breed in the surrounding marshes, as well as the common teal. On the 24th Mr. Thomas Southwell observed more than one old female shoveller, with young ones, amongst other wild ducks, on the meres of Wretham Heath.

HENRY STEVENSON.

10, Unthank's Road, Norwich,
September, 1874.

Notes on the Birds of Walney Island.

By HENRY DURNFORD, Esq.

HAVING spent two days on Walney Island, with a friend, at the beginning of July last, I am in hopes that some of my notes will be of interest to the readers of the 'Zoologist.'

We arrived at Barrow on the evening of the 3rd of July, and put up at the 'Ferry Hotel,' near the village of North Scale, where I stayed last year (see Zool. S. S. 3603). The visitor here must be content with rough fare, but the position of the inn will make up for any drawbacks in this respect, if the object of the visit be the study of some of the most beautiful of our indigenous birds.

On the 4th we walked to the nesting-ground of *Larus ridibundus* and *Sterna cantiaca*, at the north end of the island. Most of the young gulls had flown, but twenty or thirty were still in the nestling state, and a few eggs remained to be hatched, though we could hear the chicks squeaking in the shell. Owing to the extremely dry spring, and consequent scarcity of worms and insect-food, there has been great mortality amongst the gulls this

year, and the carcasses of young ones were lying about on the ground in every direction, whilst here and there an adult bird might be seen.

We searched carefully for eggs of *Sterna cantiaca*, but I believe in every case the young were hatched, and in most instances had left the neighbourhood with their parents. We found a single young bird, about a fortnight old; and four or five pairs, which kept screaming over our heads amongst the gulls, by their actions evidently had young ones, though we were unable to find any others.

The common and arctic terns, the former of which is the most numerous species here, were nearly all hatched, but many young birds were not yet on the wing. I was unable to distinguish the young of these birds, as they ran about on the ground, whilst old ones of both species were screaming overhead; but I found about a dozen specimens, of nearly equal size, picked up at random, to differ exceedingly, especially in the intensity of colouring on the chin and throat, the patch of colour there varying from light yellowish brown in some specimens to jet-black in others. The same remark applies to the markings on the back, sides and head, though it is not so patent in those parts as on the throat. In some examples, again, the down from the base of the bill to the crown of the head, and that in front of the eyes was black, whilst in others it was light yellowish brown. I am unable to say whether these differences constitute marks of distinction between the two species, but it seems likely that this is the case; I should, however, be much obliged for any information on this subject. The young terns are nearly helpless on first leaving the shell, and can then merely crawl, but they soon become lively, active little creatures, and when disturbed hide themselves in the nearest tuft of grass.

We saw no lesser terns, and the statement of the watcher, who accompanied us, that the old and young had left the neighbourhood, was corroborated by what we saw the following day at the south end of the island; he also informed us that they had been scarce this year.

After leaving the north end we continued our walk along the west coast. We observed ringed plovers and oystercatchers to be numerous, many of the latter by their actions evidently having young under their care. Flocks of curlews were feeding on the ooze, and we saw a few shieldrakes and some immature common and herring gulls.

The 5th of July we devoted to the south end of the island: here the terns, from having their nests continually robbed, are later in hatching out their young than those at the north end. We found *Sterna fluviatilis* much more numerous than *S. Hirundo*, and I may here mention that six specimens which the lighthouse-keeper shot for me subsequent to my visit were all of the former species. We examined about forty nests, and found them in every case lined with a few fragments of the coarse grass which grows abundantly on the sand-hills. On some low grassy dunes, about a hundred yards above high-water mark, we found a tern's nest, composed entirely of little bits of drift-wood, containing two eggs. There were no other nests in the immediate vicinity, but several old birds (*S. fluviatilis*) were seen close by. It may be remembered that on the 31st of May, 1864, Mr. Harting found on Walney Island a tern's nest composed of drift-wood and sand-grass, and that he believed it belonged to *Sterna Dougallii* (see Zool. 9156); but in a letter lately received from that gentleman he tells me that *Sterna fluviatilis* occasionally makes its nest of these materials. I believe we saw specimens of the roseate tern near the lighthouse, but I could not satisfactorily identify any, and it is generally impossible to distinguish its eggs from those of the other species, unless the owner be secured. Here, as at the north end, the lesser terns had flown, and we only saw two pairs.

We found four young oystercatchers on the west coast; they are very difficult to discover, as they conceal themselves cleverly by squatting among the large round stones, which they closely resemble in colour. The old birds were very clamorous, using every device to draw us away. The development of the beak must be very rapid in this species, as in one specimen I examined, which was just attaining its wing-feathers, it showed scarcely any signs of its peculiar elongated and wedge-shaped form. Geldart, the lighthouse keeper, and a very intelligent man, who is well acquainted with the birds that breed on the south end of the island, assured us that flocks of oystercatchers frequent Foulney and Walney Islands all through the spring, so from some reason or other there must be many barren birds.

From Walney we crossed in the lighthouse-keeper's boat to Foulney Island. Here we found large flocks of oystercatchers (old and young), curlews, blackheaded and herring gulls, and a small flock of immature gray plovers; also a few ringed plovers on the

shingle. Geldart told us he had seen no lesser terns about Foulney this spring, as in former years, and we found none when we were there; from some cause this species of tern is much diminished in numbers on Walney Island, and has apparently ceased to breed on Foulney.

HENRY DURNFORD.

Note on the Noctule Bat.—The following observations on this bat have been made in the parish of Northrepps:—On the 31st of July last about a score of large bats, apparently Noctules, were disturbed from a hole in an oak tree, where a pair of green woodpeckers nested in 1872, but none of the bats were captured. On the 17th of September the same hole was again examined, but no bats were in it; a hole in another oak, excavated by a pair of green woodpeckers in 1873, was next examined: this hole was found to contain nine noctules, which were all caught; of these eight were males and one a female, being the first instance which I have met with of both sexes of this bat being found in the same hole. On the 18th of September a hole in a beech tree, where a pair of starlings nested last spring, was examined, and two female noctules were taken from it, which appeared to be all that the hole contained, although from its shape this could not be ascertained with entire certainty. The actions of the noctules when awaking from their diurnal sleep at the approach of evening are curious and grotesque. They frequently open and shut their mouths for several consecutive seconds with an exceedingly rapid motion of the lower jaw; this action is succeeded by the tongue being protruded about the eighth of an inch, and the lips being thus thoroughly licked. When this is accomplished, a hearty yawn usually follows, the mouth being opened in the process to its utmost width, and the next employment undertaken is an attack on the small parasitic insects which infest the fur of these bats. The sides of the body are vigorously scratched by a rapid and continuous action of the hind claws, and the head is bent under the body whilst the mouth is employed in active investigation amongst the fur of the under surface. These bats when fully awake usually begin to crawl over one another, a process which generally evokes a stridulous chirping cry from the individuals which compose the lower strata of the cluster. I observe that the noctule when placed upon the level ground is able to take wing from thence apparently without difficulty.—*J. H. Gurney; September, 1874.*

Accident to a Weasel and to a Redbreast.—In the first week of September a singular accident occurred to a weasel at Keswick, near Norwich, in a garden surrounded by a fence of old split oak palings set on three courses of brickwork. Some men who were at work in the garden about four o'clock in the afternoon heard a singular cry, and on going to

the spot found that it proceeded from a weasel, which, while endeavouring to force its way through a small opening between two of the pales, about fourteen inches from the ground, had stuck fast by its neck between the pales, and was there hanging when it was found and killed by the gardeners. It is curious that last winter I saw a redbreast, which had been caught by its neck in a similar manner between two upright slates which formed a portion of a garden fence.—*J. H. Gurney.*

British Association for the Advancement of Science. Belfast, 1874.—

The Committee reappointed at Bradford to continue the investigation on the desirability of establishing a "close time" for the preservation of indigenous animals, beg leave to report as follows:—1. The Report of the Select Committee, appointed in 1873 by the House of Commons to consider the subject of the Protection of Wild Birds, which had not been published when your Committee agreed to their last Report, appeared shortly afterwards, and contained recommendations almost entirely identical with the anticipations of your Committee. 2. These recommendations were so fully considered by your Committee in their last Report, that they think it unnecessary to refer again to the subject beyond expressing their regret at finding, from the printed and published evidence taken by the Select Committee, that its recommendations were not at all in accordance with such parts of that evidence as your Committee deem the most trustworthy and valuable. 3. The delay in the meeting of Parliament, occasioned by the General Election and change of Ministry, made your Committee believe that it would be inexpedient for them to attempt any amendment of the Wild Birds Protection Act during the late Session. 4. In the House of Lords the Earl De la Warr introduced a Bill intituled "An Act for the more effectual Protection of Wild Birds during the Breeding Season," the principal feature of which was to render penal the taking of certain birds' eggs. This Bill was not based on any of the recommendations of the Select Committee of the House of Commons (1873), and still less on any suggestions which have ever proceeded from your Committee. 5. Lord De la Warr's Bill was withdrawn; and your Committee take this opportunity of declaring their belief that the practice of birds'-nesting is and has been so much followed in England that no Act of Parliament, except one of the most severe character, could stop it; while any enactment of that kind would, by filling the gaols with boys (often of a tender age), excite a strong and uniform feeling of hostility against all measures for the protection of indigenous animals, even among many of those who are at present favourably disposed to it. 6. Your Committee believe that the effect of birds'-nesting on such kinds of birds as are known to be diminishing in numbers is altogether inappreciable, while its effect on those whose numbers are not decreasing may be safely

disregarded, and consequently that there is no need of any legislative interference with the practice. They again repeat their conviction that the only practical mode of checking the diminution of such birds as have been proved to be decreasing is the effectual protection of the adults from destruction during the breeding-season. 7. Your Committee find that while the Sea-Birds Preservation Act continues to work successfully, being not only popular but also effective in its operation, the Wild Birds Protection Act has done little if any thing towards attaining the objects for which it was passed, and in various quarters still gives considerable discontent. 8. Your Committee have once more to point out, as they have done in former Reports, that the birds commonly known as "Wild Fowl" are subject to very great persecution through the inadequacy of the present law to protect them, that they are rapidly decreasing in number, and that they are not only perfectly innocuous, but of great value as food. Consequently your Committee trust that the efforts they hope to make on behalf of "Wild Fowl" in the next Session of Parliament will obtain a very general support. 9. Representations as to the inordinate slaughter of seals which takes place every spring in the North-Atlantic Ocean have been made to some members of your Committee. There can be no doubt that such slaughter carried on at that season, and with increasing activity, will soon bring these animals to the verge of extermination, as has been the case in so many parts of the world; and, since their destruction will affect a very large trade, their proper protection seems to be a subject not at all unworthy of the consideration of Her Majesty's Government. Your Committee, however, are of opinion that the subject is one lying beyond the powers entrusted to them, since the seals of the North Atlantic can in no sense be termed "indigenous animals," and accordingly refrain from offering any other remark upon it. 10. Your Committee respectfully request their reappointment.

Shore Birds on the Cley and Blakeney Muds.—On September the 9th I was shooting with some friends on the Cley and Blakeney muds, and we obtained a little stint, a purple sandpiper, a Kentish plover, some pigmy curlews, besides godwits, whimbrel, &c., and other waders which are always to be met with at this season of the year.—*J. H. Gurney, jun. ; Northrepps Hall, Norwich.*

Arrival of Spring Birds in Nottinghamshire.—March 31st, chiffchaff, Rainworth. April 2nd, sand martin, Rainworth; 3rd, willow wren, Rainworth; 10th, yellow wagtail, Rainworth; 20th, swallow and wood wren, Rainworth; 21st, flycatcher, Mansfield; 24th, nightjar, Rainworth; 25th, cuckoo and corn crake, Mansfield; 26th, house martin and whitethroat, Blidworth; 27th, sedge warbler and whinchat, Rainworth; 29th, wheatear, Rainworth; 30th, swift, Mansfield. May 1st, common sandpiper, Rainworth; 9th, blackcap, Rainworth.—*J. Whitaker ; Rainworth Lodge, near Mansfield, Notts.*

Curious Nesting of the Flycatcher.—Some days ago I received a letter from a friend in which he gives the following account of the site chosen by a pair of flycatchers for rearing their young: he writes, "In the spring of this year I discovered, in a fork of a plum tree trained to a wall in the front of my house, a last year's bird's nest—by what bird built I cannot say. I was surprised some time since (about July 1st) to discover four young flycatchers fully fledged, and a few days after they left the nest. I could not perceive any addition to, or reconstruction of, the old bird's-nest."—*John A. Dockray; Winslow, Bucks, September 14, 1874.*

Chiffchaff, Swift and Fieldfare.—On Friday, September 11th, when shooting at Calverton, near here, I was surprised to hear the notes of the chiffchaff; it was in a tall hedge. To make sure I went and saw the bird, and it repeated its call or song several times. I also saw a swift the same day. Are not both these late? When shooting at Blidworth the next day several of us saw a fieldfare; we put it out of a high holly hedge, and it continued flying before us to the top of the field; this is very early.—*J. Whitaker; September, 1874.*

English Sparrows in Philadelphia.—I was in Philadelphia yesterday, and in passing down Walnut Street I was pleased to see a flock of at least two dozen English sparrows feeding in the street, and perfectly fearless of the passers by. Amongst the flock was one little fellow nearly white, and forming a very singular contrast with the other birds. I stood looking at them for several minutes, and left them in the full enjoyment of their meal. The sparrows in Philadelphia and in other American cities are made quite pets of, and are fed regularly by the inhabitants, consequently they become very tame.—*Edward Sweetapple; Public Ledger Paper Mills, Elkton, Maryland, U.S., September 5, 1874.*

Memorandum on the Crowned Pigeon.—Having been long accustomed to see the domestic pigeon emerge from its nest-pan full-grown and in all respects similar to its parents, except some small critical distinctions of beak and feathers and the tendency to sport in colour which is common to nearly all domestic animals, I was somewhat surprised to see at the Zoo a specimen of the crowned pigeon (*Columba coronata* of Linneus) leaving its nest when it had not acquired a third part of the magnitude of its parents, yet was in other respects precisely similar to them. Looking back a very long time into the past, I think it must be twenty years, I recollect a similar instance of this bird breeding in the Gardens, and of its producing a single chick. On inquiring of Mr. Travis, the very intelligent and obliging keeper who has the charge of the Western Aviary, I learned two or three other particulars respecting these grand birds which may interest some of my readers as much as they do myself. The time of incubation is exactly one calendar month, and the additional period spent in the nest while receiving pigeon's

milk rather more than a month. On leaving the nest the young bird flew steadily and vigorously. I cannot speak too highly of the state of this Western Aviary; its cleanliness and bright appearance are above all praise.—*Edward Newman.*

The Apteryx; its Mode of Feeding.—While serving in New Zealand, a few years ago, I one day, in visiting a Maori's hut, found on the premises a tame kiwi, and the proprietor about to feed his pet. A small earthen vessel, capable of containing about half-a-pint, was produced, full of ordinary earth-worms, and was placed before the kiwi; but, to my surprise, although the living mass of food was wriggling and crawling about, as worms are wont, before the bird, he did not in the least appear to comprehend that a sumptuous feast was straight before him, and within six inches of his beak. This stage of the proceedings appeared to me rather incomprehensible, as of course I had concluded that the worms were intended to be eaten by the bird. I began to conclude that the kiwi was blind, and I further could not well make out why it was that my noble host—in concert with his wife and the little ones—was all this time much amused, evidently at my expense. Well, when the whole family had had a good laugh at my visible surprise and innocence on the subject, the Maori placed one of his fingers against the back of the kiwi's head (as the bird stood stupidly and vacantly looking about in front of the vessel full of worms), and gently pressed it forwards and downwards until the beak touched the worms. Instantly the most fearful gobbling, gulping, and swallowing of worms took place. The heretofore dreamy-looking bird in the most marvellous manner woke up, and truly great were his powers and exertions in the worm-devouring line. Having allowed him to indulge his voracity for a few seconds, his feeder withdrew the vessel an inch or two, and, strange to say, the bird was immediately unconscious of the whereabouts of his food. It was only while his beak was in actual contact with the worms that he had the slightest knowledge of their presence. This fact I tested, as above described, several times. I next asked the Maori to let me see the bird finding its food in its own natural way, and he took it out to the adjoining little garden. Here, under some little Indian corn plants, the kiwi set to work in the most vigorous manner—albeit in the most promiscuous and hap-hazard way as regards the selection of ground—driving his long beak up to its very base into the soft soil. Every now and again, however, a delay in withdrawing the beak, and great excitement, and evidently the employment of some subterranean dexterity on the part of the director of the said beak, resulted in a worm being brought to the surface and quickly devoured.

[Although this is published in the 'Field' without the voucher of a real name, it is perfectly reliable.—*E. Newman.*]

Ostriches hatching their Eggs.—It may interest some of your readers to know that I have just received news that one hundred ostrich eggs were

hatched, and the chickens reared, on my father's farm of Kuyl Fonteyn, Colesburg, Cape of Good Hope, last year. I believe this is the first instance of ostriches hatching their own eggs in a domesticated state. He got four hundred eggs in all last year, but failed entirely to hatch any by artificial means. The old idea that ostriches' eggs will hatch in the sun is entirely erroneous. The ostrich is as careful a mother as any domestic fowl, only leaving its nest at noon when the sun has its fullest force, and is so jealous of any intrusion that, as soon as it knows its nest is discovered, if possible it destroys the eggs. I shall be happy to answer any questions, either as to ostrich-farming to those seeking information, or to naturalists about their habits, that may be addressed to me.—*J. A. Murray; Wanderer's Club, St. James's, September 10, 1874.—From the 'Field.'*

On the Distribution of the Species of Cassowaries.—Until very recently there was supposed to be only one species of *Casuarius*; now at least seven species are known, each with a distinct and very limited area, the genus being entirely confined to Northern Australia, New Guinea, and the adjacent isles. A full exploration of New Guinea would probably lead to the discovery of a large number of most interesting new species.—*P. L. Sclater, at British Association.*

Little Bittern near Epping.—A specimen of this rare bird was shot, on the 15th instant, at Passingford Bridge, about five miles from Epping. It was first observed by Miss Stevens, daughter of Mr. Stevens, miller, and a few days after was shot by his man. It appears to be a young bird which had just completed its first autumnal moult; it is probably a male, but in consequence of injury by shot, the sex could not be ascertained. It is in beautiful plumage.—*Henry Doubleday; Epping, September 10, 1874.*

Bartailed Godwit in Nottinghamshire.—On September 8th a flock of between thirty and forty bartailed godwits passed over the heads of a party of gentlemen shooting near Farnsfield, and six were killed. They were in beautiful plumage, and very fat. They varied much in size; the largest, weighing ten ounces, was seventeen inches from tip of beak to end of tail; the smallest six ounces, and thirteen inches in length. The larger ones were females, which in this species is always the case. The species has occurred but rarely in Nottinghamshire.—*J. Whitaker.*

White Stork near Berwick-on-Tweed.—A white stork, in very indifferent condition, was shot on the 10th of June at Scremerston, three miles from Berwick-on-Tweed; its dimensions are given in the 'Field' of July 4th.

Black Gannet.—I have just seen flying past a bird which is new to me, and I shall be glad to know whether you have heard of any round our coasts before,—a black gannet, not brown (*i. e.* not in the ordinary plumage of a young bird), but jet-black on the back, wings and sides, white neck and head, and white belly and breast—evidently not a young bird by its strong even flight and well-defined colour. Cruising last year in the early part of

June off the Cornish coast, I saw a gannet somewhat similar in markings, only with more white about it—in fact, I should call it a piebald variety; but the one to-day seems to me more distinct in its plumage.—*W. Taylor; Yacht 'Seabelle,' off Sidmouth, September 16, 1874.*

[I know nothing of such a variety.—*E. Newman.*]

Little Auk and Dunlin.—Having read Dr. Saxby's notes on the 'Birds of Shetland,' I would recommend all who may be desirous of acquiring information respecting the habits, migration, nidification, and eggs of the rarer aquatic species, to procure this graphic, instructive and interesting work, one that will amply repay the perusal—moreover, serve as a reliable book of reference, particularly as regards the transition states of plumage, variations in size, colouring, &c., of the eggs,—no author that I am acquainted with having given us so clear an insight into these particulars, so that one cannot but feel that in Dr. Saxby we had the right man in the right place. Though I must not anticipate the reviewer, I may perhaps venture to remark on a species or two, the little auk, for instance. Dr. Saxby says, "It has become apparent that the numbers occasionally drifted ashore dead have been unable to withstand the force of the gale," and that as "the storm-driven birds seldom occur in the day-time, we may consider that darkness is the main cause." As to the darkness, it need be obscure, indeed, for the auk not to know its whereabouts. We are told that "it is far more ready to make use of its wings than either the guillemot or razorbill"—why, then, not seek the sheltering shores or cliffs? Starvation, I believe, to be the real cause, the auk, unlike many other species, not foraging inland or along shore. Dr. Saxby remarks, "It seemed a curious fact that almost without exception the birds were washed ashore by an easterly wind;" the lower degree of temperature might partly account for the greater mortality. That these storm-driven and weather-bound birds should not have been in "poor condition," though found with "empty stomachs," is not surprising, as it does not necessarily follow that they should have become either thin or emaciated in so short a time. With regard to the dunlin, Dr. Saxby remarks, "that another species, or very distinct variety, is supposed to exist in some parts of Scotland." If so, it is very improbable that it should be confined to the northern part of the kingdom, seeing that *Tringa variabilis* is so commonly and widely distributed. As to undersized birds and varieties, they are to be met with in many species, and the length of bill is no certain criterion to guide one; for instance, having some years since shot a sandpiper with an unusually short bill, and thinking it might be different from the common species, or a *rara avis*, I showed it to a well-known ornithologist from north of the Tweed, who had one of the finest collections in the kingdom; his ready remark was, "Birds' beaks, like men's noses, are not all of one length." I quoted Macgillivray (and might have cited Brisson) as an authority, but

found that he, like the prophets of old, was not duly honoured in his own country; however, there is some truth in the quaint remark referred to.—*Henry Hadfield; August 7, 1874.*

Affection of the Sea Gull for its Young.—Standing on the jetty at Inverary, on Loch Fyne, one morning in the autumn of 1870, I witnessed an interesting instance of the affection of the gull for its offspring. Three birds, of the species which may be seen any day following in the wake of the tourist steamers, two old ones and a young one, were allured, by a few pieces of biscuit adroitly jerked far out into the loch by a friend of mine, within a short distance of the jetty. The old birds too knowing to come within a stone's throw, the tempting morsels were picked up by the unwary young one. The supply of biscuit exhausted, one of those lads who are invariably on the spot if an opportunity for mischief presents itself, began to throw stones at the young gull, whose brilliant white plumage made it an admirable mark; the old birds, seeing the danger it was in, circled round and round, urging it by their cries and example to leave the dangerous spot, twice flying straight away, as though leaving it behind, and then returning. The foolish bird, at last struck by a piece of coal, fell into the loch, lying upon the water like a little ball of snow-white feathers. At the sight of this mishap the old birds were evidently in great distress, their motions and cries being redoubled. Before, however, the lad who had fetched it down, and had jumped into a boat, could paddle to pick it up, the bird, which had been only stunned, fluttered and flew a few yards, when the old birds instantly swooped down to its assistance, by their cries encouraged it, and it slowly rose between them and flew away, one of the old ones on either side, straight up the loch, evidently a sadder and a wiser bird, having received a lesson it was not likely soon to forget.—*Richard Ball; Upper Mary Street, Birmingham, September 21, 1874.*

Name of a Bird.—A very peculiar looking bird was shot by Mr. J. Knight, of Wrecclesham, near Farnham, on the 19th September; its head, wings, back and tail are of a beautiful cream-colour, beak yellow, and its breast is spotted similar to that of a missel thrush. The bird is now in the hands of a birdstuffer of this town, who believes it to be the common song thrush.—*W. H. Legg; Farnham, Surrey.*

[Is it not a pied variety of the missel thrush?—*E. Newman.*]

Beaumaris Shark taken off Hastings.—On the 28th of August a fine specimen of the Beaumaris shark (*Lamna monensis*) was taken in the nets of one of our fishing-boats about five miles off Hastings. It measured eight feet six inches in length, and the gape of the jaws laterally and perpendicularly was nine inches and a half. I have the jaws and the vertebral column; the diameter of the largest vertebra is one inch and

three-eighths. For the whole length of the vertebral column above and below there is a stout ridge of cartilage strengthening and effectually maintaining the vertebræ in their proper position. When I first saw it the men had taken out the whole of the viscera; I could not therefore get its correct circumference. They told me that the liver weighed four pounds. This is the second specimen of the species taken off our coast; the first was a small one, and I sent you an account of its capture at the time. The largest specimen recorded by Yarrell was said to be nine feet six inches in length, and was a female. I believe the specimen I have described was a male, but I am not certain of that fact.—*J. S. Bowerbank; 2, East Ascent, St. Leonards-on-Sea, September 7, 1874.*

Salpa spinosa (Otto) off the West Coast of Ireland.—I first found this oceanic mollusk in August, 1869, when it was floating near the surface of the sea, in very great abundance, between Colam Head and the Isles of Arran. Again, this season, I have met with it plentifully in the vicinity of the Skiara Rocks, and around Deer Island, to the south-west of Roundstone, in Connemara.—*A. G. More; Dublin, September 4, 1874.*

Zoological Society's Gardens in Regent's Park.—Since my last notice the following animals have been added to the collection. I have omitted the scientific or technical name, except in instances where it is required from the circumstance of the species having no well-known English name. I cannot conceive any advantage can result from giving a Latin name when the animal possesses a familiar English one: thus, in the instance of the giraffe, the addition of the words "*Camelopardalis Giraffa*"; in that of the kingfisher the words "*Alcedo Ispida*," &c., obscures and encumbers the meaning: on the other hand, such unpleasant English words as "mastigure," "kinkajou," &c., may perhaps be allowed what little advantage can be derived from a second name. The selection may give a little trouble to myself as the compiler, but certainly will save trouble to the reader.

Published 9th July.—A Himalayan bear, presented by Mr. George Lockie; two red kangaroos from Australia, presented by the Acclimatisation Society of Melbourne; two Audouin's gulls (*Larus Audouini*) from Sardinia, presented by Lord Lilford; a Kappler's armadillo (*Tatusia Kappleri*) from Surinam, deposited; two musquashes (*Fiber zibeticus*) from North America, received in exchange; a harpy eagle from Paraguay; seven Ariel toucans from Brazil, purchased; a collared fruit-bat, born in the Gardens.

Published 16th July.—A banded ichneumon from West Africa, presented by Lady Sheffield; a rose-ringed parakeet from the Zambesi River,

presented by Mrs. Loveday; a chimpanzee from West Africa; a spectacled bear from the Upper Amazon; an Eyra cat from South America; a Nisnas monkey, an Eleonora falcon, deposited; two pumas, and nine rosybilled ducks (*Metopiana peposuca*), born in the Gardens.

Published 23rd July.—Three giraffes from Upper Nubia, purchased; two passerine owls (*Glaucidium passerinum*), European, presented by Mr. C. W. Tait; a Reeves' muntjac (*Cerrulus Reevesi*), born in the Gardens; a slow loris (*Nycticebus tardigradus*), from the Malay region, deposited; a coati, brown variety, and a spotted cavy from South America, purchased; two bronzewing pigeons and an olive weaver-bird, hatched in the Gardens.

Published 30th July.—Two tigers from Calcutta; two yellowbilled sheathbills (*Chionis alba*) from the Southern Ocean, presented by Mr. H. Roberts; a Wanderoo monkey (*Macacus Silenus*) from the Malabar Coast, presented by Lieut. Vipan; a rosecrested cockatoo from the Moluccas, presented by Mr. John Elms; three greybreasted parakeets (*Bolborhynchus monachus*) from Monte Video, presented by Mr. C. Purnchard; a king vulture from Tropical America; a redbacked buzzard (*Buteo erythronotus*) from South America, purchased; a Philantomba antelope (*Cephalophus Maxwellii*), born in the Gardens.

Published 6th August.—A laughing kingfisher from Australia, presented by Mr. J. S. White; two black-handed spider monkeys (*Ateles melanochir*) from Central America, presented by Mr. S. W. Rix; a greater sulphur-crested cockatoo from Australia, presented by Miss S. Hooper; a Tamandua ant-eater (*Tamandua tetradactyla*) from South America, deposited; and three blotched genets (*Genetta tigrina*), born in the Gardens.

Published 13th August.—Two Egyptian gazelles (*Gazella Dorcas*) from Egypt, presented by Mr. G. Muscat; four rufous tinamous (*Rhynchotus rufescens*) from the Argentine Republic, presented by Mr. Alfred O. Lumb; three mastigures (*Uromastix*) from Persia, presented by Captain Phillips; one Yaguarundi cat (*Felis Yaguarundi*) from South America, deposited.

Published 20th August.—A puma and three kinkajous (*Cercoleptes caudivolvulus*) from South America, presented by Mr. W. Delisle Powles; a Cuvier's toucan from Brazil, presented by Mr. Philip Harrington; a Macaque monkey (*Macacus cynomolgus*), white variety, from India, presented by Sir Andrew Clarke; a West African python (*Python Seba*), deposited; a crested agouti (*Dasyprocta cristata*), from South America; five common kingfishers, British, purchased.

Published 27th August.—Two Chukar partridges (*Cuccabis Chukar*) from N.W. India, presented by the Hon. Justice Jackson; four Sandwich terns, four avocets, European, purchased; a common crowned pigeon (*Goura coronata*), two bronzewing pigeons, hatched in the Gardens; a black-eared marmoset (*Hapale penicillata*) from Brazil; and two suricates, from South America, deposited.

Published 3rd September.—A cassowary, probably an undescribed species, from N.E. New Guinea, presented by Capt. Maisby; a Javan chevrotain (*Tragulus javanicus*) from Java, presented by Mr. G. Mannings; a Formosan deer (*Cervus pseudaxis*) from the Island of Formosa, presented by Mr. Abel A. J. Gower; two black swans from Australia, presented by Mr. R. H. Bower; an Indian python; a Vervet monkey (*Cercopithecus Lalandii*) from South Africa, presented by Mr. C. Hassam; two black-eared marmosets (*Hapale penicillata*) from Brazil, presented by Mr. J. P. Harrison.

Published 10th September.—A Toque monkey (*Macacus pileatus*) from Ceylon, presented by Mrs. Thomas; a Macaque monkey (*Macacus cynomologus*), from India; a Malbrouck monkey (*Cercopithecus cynosurus*) from West Africa, presented by Mr. H. C. Marekmann de Lichtabell; an Arctic fox, from the Arctic Circle; a blackheaded gull, European, presented by Mr. Keell; a prairie marmot (*Arctomys ludovicianus*) from North America, presented by Mr. Thellusson; a Guilding's amazon (*Chrysotis Guildingi*) from St. Vincent, purchased; four Houbara bustards, from Tripoli, deposited.

Published 17th September.—A serval from West Africa, presented by Mr. Spencer Shield; a cinereous sea eagle, from Norway, presented by Mr. W. J. Sadler; two peregrine falcons, from Europe, presented by Mr. Herbert Wood; a Macaque monkey, from India, presented by Mr. P. T. Wharton; a crested pigeon, two graceful ground doves (*Geopelia cuneata*), hatched in the Gardens; two green fruit-pigeons (*Carpophaga sylvatica*), deposited.

Published 24th September.—A chimpanzee (*Troglodytes niger*); a bay antelope (*Cephalophus dorsalis*), and three royal pythons (*Python regius*), from West Africa, presented by Mr. C. B. Mosse; a king vulture from South America, presented by Mr. G. I. Brumschweiler; a gray ichneumon from India, presented by Captain Hallett; two little bitterns, European, presented by Mr. A. A. van Bemmelen; an alligator from Demerara, presented by Capt. Turner; a yellow-fronted amazon (*Chrysotis ochrocephala*) from Guiana, deposited.

Among these additions some will be regarded with interest by all visitors, such, for instance, as the giraffes, our stock of which had been diminished by fire and dilapidated by disease; but to others, and myself among the number, less showy additions have equal interest: the sheathbills are particularly interesting; these sea-pigeons, as they may be called, are of a snowy whiteness, and among uninstructed visitors, who feed them with bread and buns, they pass for pigeons, to which, in their walk, their mode of feeding, the movement of the neck feathers, &c., they have a very striking resemblance.—*Edward Newman.*

Notices of New Books.

The Birds of Shetland, with Observations on their Habits, Migration and Occasional Appearance. By the late HENRY L. SAXBY, M.D., of Balta Sound, Unst. Edited by his Brother, STEPHEN H. SAXBY, M.A., Vicar of East Clevedon, Somerset. Demy 8vo, 398 pp. letterpress, eight tinted litho. plates. Edinburgh: Maclachlan and Stewart. London: Simpkin, Marshall and Co. 1874.

(SECOND NOTICE.)

Dr. SAXBY, in writing of the eggs of the hooded crow, says, "They are four in number, and, as a rule, precisely similar to those of the carrion crow;" but I find no allusion to the possibility of these two birds constituting a single but dimorphic species. Mr. Hewitson has this passage under "carrion crow": "I have chosen the figures of the plate that they might not only represent each its own species, but that of the nearly allied species as well;" and under "hooded crow," he says, "The eggs are four or five in number, and do not differ from those of the carrion crow or rook, except in size." The question "What is a species?" I have attempted to solve (S. S. 1345) in these words—"I conceive a species to be composed of such living individuals as possess perfect eugenism among themselves; that is of *individuals any pair of which can reproduce their kind, their descendants being equally prolific*; and I conceive also that all structural characters, whether of form, size, or colour, are insufficient to the differentiation of species; not useless, but insufficient." So far as I know, this idea has not made a single convert; but I cling to it still, hoping that some day or other it may be received with more favour. My readers will perceive how intimately it bears on the specific identity or distinctness of the two crows.

Temminck tells us that they breed together: he says—"The black and hooded crow sometimes breed together; they produce mongrels which resemble one or other of the species: this occurs in the southern and eastern countries of Europe, where the black crow is uncommon, but we find no instance of it where both species are common."—*Temminck*, i. 109. Under "hooded crow" Temminck

adds, as an "accidental variation,"—"The plumage is often entirely white or almost totally black." Selby repeats this observation as his own: "Sometimes this bird varies in colour, and is found entirely white or black."—*Illustrations of British Ornithology*, vol. i. p. 352.

Mr. W. C. Williamson, Curator to the Natural History Society, reporting to the Zoological Society of London in 1836, says—"In one instance a female hooded crow was observed to pair with a carrion crow in a large tree at Hackness, where they succeeded in rearing their young. The carrion crow was shot by the gamekeeper, but in the following year the hooded crow returned with a new mate of the same sable hue as the former one to her old nest. The carrion crow and the young crows were again all shot; the old female by her vigilance escaped all the efforts of the keepers to destroy her, and a third time returned with a fresh mate; she was not, however, again so successful, but was shot, and is now preserved in the Scarborough Museum. The young birds varied, some resembling the hooded and others the carrion crow in their plumage." Macgillivray, after mentioning this record, adds—"Two or three instances of the same kind are mentioned as having taken place in the south of Scotland, which would lead us to believe that a hooded crow left perhaps accidentally in a district where there are none of its kind may readily pair with the carrion crow."—*Macg.*, iii. 721. Sir William Jardine states that he has repeatedly seen the two breeding together, "the produce being birds of intermediate plumage"; and again, "In the male specimens the gray parts of the back and under parts are indicated by the edges of the feathers being narrowly margined with gray." Unfortunately I do not possess Sir William Jardine's work, but cite this from Mr. Gray's 'Birds of the West of Scotland,' p. 171. Mr. Gray appends this remark to the passage—"A state of plumage which I have not observed in any of the birds of mixed breed that have come under my notice, the offspring from the nest showing dark specimens of a genuine black, and others with gray markings equally decided."

Several observers state that in these cases of interbreeding the young are sometimes equally divided in number, that is two carrion and two hooded, sometimes three and two, sometimes only one of one kind and the remainder of the other. I cannot find that sex has any influence on these discrepancies. A friend whom I have lately met at the Zoo tells me of an instance of two carrion and

two hooded young ones having been found in one nest; he will, I trust, give further details in a future number of the 'Zoologist.' Mr. Gray gives the following additional information from personal observation: it is elicited by Mr. Yarrell's unfortunate remark that "birds unite with a strange partner rather than have no partner at all" (ii. 92). "To this suggestion I can hardly assent, as I have repeatedly seen two, or even three, carrion crows fighting for the possession of a graybacked one where the two kinds were flying about in equal numbers. The last encounter of the kind I witnessed happened at Loch Melfort, in Argyleshire. The three birds (two black and one gray) were flying in company across the loch, when one of the former attacked his neighbour with great spirit and caused a loud outcry. Instead of leaving the black combatants to settle their own dispute, the hooded crow, which I took to be the female, turned back on hearing the row, and joined the aggressor in buffeting the poor victim till he was drowned." In the next paragraph Mr. Gray states that "throughout the mainland of Scotland generally the carrion crow and hooded crow are found in about the same numbers." Mr. Cordeaux, in his admirable work 'Birds of the Humber District' (p. 63), seems to admit this habit of interbreeding.

In order, however, that too much stress should not be laid on this pairing of the two crows, I may mention that, at p. 5080 of the 'Zoologist' for 1857, is a well-authenticated instance of a raven pairing with a carrion crow; the result was an addled egg and two young birds, which remained in the nest until the 13th of May, after which they were seen no more: no description of these young birds is reported.

Captain Knox, in his peculiarly pleasant and instructive volume intitled 'Ornithological Rambles in Sussex,' has a remark, at p. 100, which has an indirect bearing on the question, and which I cite, not as in any way supporting my theory, but rather the reverse, thinking that when a moot point is discussed, no evidence should be rejected:—"A few years since while residing during the winter near the sea in the western part of the county [Sussex], I noticed that the carrion crow was common in the estuaries of Chichester Harbour, and along the whole line of shore from Selsea Bill to Bognor, * * * but I never could detect a single hooded crow within the same limits. This struck me the more forcibly from having previously perceived that the last species is

exceedingly numerous in the neighbourhood of Shoreham and Brighton, and the carrion crow is, in its turn, equally scarce. I may add that my subsequent observations have proved the above remarks to be correct, and that they have been corroborated by the testimony of others whose attention I had drawn to the subject."

I cannot conclude these observations without saying how acceptable will be the record of any facts bearing on this question; they will have a wider application than appears at first sight, for if it can be proved that one species of *Corvus* is dimorphic, possibly it may lead to the detection of similar dimorphism in other species. The nutcracker, raven, and many others must be treated with a minute investigation.

The hooded, as regards his relationship to the carrion, crow has not received that strict examination which he seems to deserve; a number of questions respecting him require and almost demand solution; but the subject is unattractive, and the mode of carrying out the inquiry tedious and troublesome. I would suggest these points:—1. Describe the position and materials of the nest. 2. Describe the eggs of each species, and differentiate them. What is the period of incubation in each species? 3. Enumerate the reports in which you have heard of the two species pairing together, and investigate the authenticity of such reports. 4. State whether the carrion crow in such cases is male or female. 5. State minutely the difference of food, if any. 6. State minutely any anatomical differences. It has always appeared to me that the chief differences consist in colour and in the greater or less propensity to migration. In Shetland the carrion crow is comparatively rare, and is, moreover, confounded by the inhabitants with the rook. On the breeding habits of the hooded crow Dr. Saxby has the following remarks:—

"The hooded crow seems to take no small pains to place the nest so that it shall be easily accessible to man. I am by no means a good climber, but I never saw more than one of these nests that was beyond my reach. The most singular looking nest which has yet come under my notice was that of a hooded crow. The upper part was, as usual, composed of large sea-weed stalks, &c., lined with wool, feathers, moss and hair; but this was built upon a substantial foundation of bones of ponies and sheep, collected in such quantities that the mass measured nearly a yard across, and in one part a foot in depth. Many of the bones were of so large a size that it is difficult to imagine how they could have been carried. Nor did the peculiarity end here. In my early walks along shore I had at various times collected a

number of quills of geese and great blackbacked gulls, depositing them for safety in the crevice of a rock, but the hoard having been discovered by the crows it was unceremoniously appropriated by them, and long afterwards the quills were to be seen sticking like so many skewers around the brim of the nest crossed and interwoven in a manner well calculated to afford great strength, even though they certainly gave it a very odd appearance. I have since found several nests each having a foundation of bones."—P. 135.

The late Thomas Edmonston stated (Zool. 462) that a small flock of hoopoes appeared in Shetland some years ago in the beginning of January: this is evidently a mistake, and arose from Mr. Edmonston's misreading the manuscript of a correspondent who wrote "hoopers," not "hoopoes." Nevertheless the hoopoe has occurred in Shetland, although only two instances have been authenticated—the first on the 21st of August, 1860, and the second on the 15th of August, 1861. The following notes on the habits of this pretty bird are interesting:—

"Whatever may be its habits elsewhere, they certainly have in Shetland differed greatly from all written accounts which I have met with. When alarmed it flies rather high, but seldom to a greater distance than three or four hundred yards, almost invariably alighting near a loose stone wall, among the crevices of which it will presently hide, sometimes indeed passing quite through, and suddenly appearing a long way off upon the other side. It seems to prefer wet swampy places, yet I have known it frequent the dryest and most barren fields for days at a time. It runs with considerable swiftness, and even when undisturbed is exceedingly restless, seldom remaining in one spot for many seconds. Upon the wing it presents a very singular appearance, the flight being rapid, wavering, and more like that of a butterfly than of a bird. It is not easily distinguished upon the ground, but the white spotted wings and tail render it a very conspicuous object when flying."—P. 143.

The golden plover is a bird in which every naturalist is interested; we have its history, as regards Norfolk, admirably told by Mr. Stevenson, and as regards Lincolnshire by Mr. Cordeaux; in these counties it is a regular migrant, moving northward from the last-named county at the end of March; but in the cold spring of 1871 a few trips remained until the last week in April, and in the same season seven birds stayed until the 2nd of May. Mr. Gray tells us it is found throughout the Outer Hebrides at all seasons of the year, and that it is extremely abundant over the whole of the western counties of Scotland, breeding on all the hills of moderate

elevation. So in the Shetlands it is common at all seasons, but still gives evidence of its migratory propensities, the number being greatly increased for a few weeks in autumn by the very extensive flocks of southward migrants which then make a call at Shetland on their journey: the migrant columns are joined in passing by the young birds bred in Shetland, and thus their volume is increased. It is observed that the birds in these migrant flocks are tolerably familiar on first arrival, but soon become wild; indeed everyone who has had much experience in the matter of migrants must have observed that all birds are tamer on their arrival than when they have been with us a few weeks, or even days. Some attribute this to excessive fatigue from having been so long on the wing; others say that it is the constant persecution they meet with here that causes their increased timidity. Dr. Saxby informs us the sportsman experiences the greatest difficulty with young home-bred birds, and that with them it is necessary to resort to sundry devices in order to compass their destruction. The usual plan is for the sportsman to conceal the gun and then to personate somebody else or something else, crawling on all fours or walking by the side of a pony, or pretending to be an old woman. Dr. Saxby himself has occasionally strapped a plaid round his waist, petticoat-fashion, and has thus been able to obtain several shots before the trick was discovered.

The nesting habits of the golden plover are now pretty well known; year by year one or other of those genuine and original observers who constitute the backbone of Ornithology, pay a visit to our birds at the very period when occupied with the duties of nesting, and give us minute and elaborate accounts of all they see: formerly such visits and such narratives were extremely rare, now happily they are extremely common; and the future architect of a Natural History of British Birds will find an immense stock of sound buildings ready to his hand. Dr. Saxby contributes his quota to the natural history of the golden plover.

“In the little book called ‘Birdsnesting,’ the materials of the golden plover’s nest are spoken of as ‘scarcely any—a few fragments of heather and dried grasses carelessly scraped together;’ and on referring to my note-books I find that those very words might well have been applied to eleven out of the fifteen nests of this species therein described. Occasionally, however, and particularly during the first few weeks of the breeding season, the nest is constructed with more than ordinary care, and then consists of a

deep saucer-shaped cavity, thickly and compactly lined with the above-mentioned materials, measuring between five and six inches across. It is almost invariably situated among moss or heather, sometimes by the side of a stone, or upon some slight eminence where there is sufficient growth to afford concealment. The only opportunity which has fallen to my lot of observing the length of time occupied by incubation occurred three years ago. About noon on the 7th of May I found four warm eggs, and on blowing one ascertained that it was perfectly fresh. I afterwards visited the nest almost daily, and on the evening of the 23rd observed that two of the remaining three eggs were already broken by the chicks. Next morning on my approaching the nest, three young birds, mottled gray or yellow, ran out of the neighbouring heather; there was no appearance of broken shells in or near the nest. I have never known the male take any part in the task of incubation, although he is very attentive to his mate, and constantly supplies her with food while she is sitting; but both birds are so shy that at such times their habits can be witnessed only by means of long and patient watching from some good hiding place, such as a large stone or the deep channel of a burn. While the female is sitting the male takes his station upon some eminence near the nest, giving warning by his loud peculiar whistle the moment an intruder appears."—P. 160.

The eggs of the golden plover vary greatly, but can scarcely be taken for those of any other species that nests in this country, except perhaps the lapwing; and they are always larger and more richly coloured than these. I cannot commend too highly the careful manner in which Dr. Saxby has described these eggs. I believe we have yet to learn the full value of these details.

"I have long observed with no little perplexity the remarkable variety of colour which occurs in the eggs of the golden plover, and the regularity with which each colour in its turn predominates according to the degree of advancement of the season. Every year I see large numbers of the eggs, and the general rule appears to be that those which are laid early in the season have a dingy hue, the ground colour being strongly tinged with dull olive-green, and that a little later this begins gradually to become less frequent, giving place to creamy white, sometimes richly tinged with warm yellowish brown; the latter is deepest and most common in June and July, when the breeding season is drawing to its close. At this time also the spots and blotches are very abundant and are more of a reddish brown colour. Possibly the dingy and earlier eggs are those of older birds. The most beautiful variety is of a warm cream-colour, with intensely deep brown blotches or spots, and with numerous large spots of light purplish gray. The usual size is about two inches in length by one inch and a half in

breadth, but I have had one specimen measuring two inches and four lines by one inch and nine lines. The eggs are far superior in flavour to those of the peewit."—P. 161.

The ringed plover, or ringed dotterel, comes out in rather a new character from Dr. Saxby's pen—that of a domestic pet. I entirely agree with him in believing it must be a little perplexity to a stranger on taking possession of his lodgings to hear the wild note of this pretty little bird coming from under the sofa or from behind the window-curtains, but it seems such an occurrence may take place in Shetland.

Desirous of solving the problem as to the existence of the smaller race of dotterels observed by Stevenson, Harting, and others, Dr. Saxby paid particular attention to this point, and certainly met with "a few individuals of less than ordinary size," but he is evidently disinclined to consider this occasional discrepancy any more than accidental, and he also fails to perceive the other characters which have been pointed out as distinctive, concluding that fineness and length in the claws is scarcely a safe indication of specific difference, "since the claws of young waders have that peculiarity before they become abraded by the sand and gravel." Mr. Gray (*Birds of the West of Scotland*, p. 260) seems to unite with those ornithologists who think otherwise, for he says, "The variation in the size of this species has been a source of much perplexity to me. In the spring time I have shot many specimens so much smaller than the ringed plover which breeds with us that I have long thought, seeing that they only appear in spring, that they must belong to a southern race." Dr. Saxby having failed to discover such a race in Shetland, where he has had such excellent and long-continued, may I not say such unexampled, opportunities of observation, leads me rather to a conclusion opposite to that which he evidently entertains. The fact that this smaller race does not reach Shetland is I think established by his careful and continuous observations; but the very fact that it does not seems rather to indicate a difference which may possibly be specific. This diversity of opinion is of the greatest possible value in science, because it prompts and provokes unceasing observation, the eventual result of which must be the establishment of truth.

Equally extensive have been our author's opportunities of observing the nesting habits of the dotterel, and it is evident, from the interesting passage I have cited below, that in this, as in every

other instance, he has exercised observing powers of no common kind.

“The nest is most often found upon the beach, a little above high-water mark, among sand or gravel; but most of the shores being rocky and precipitous, the sides or even the very tops of the hills are frequently resorted to. So common are the nests in these situations that I have found three, quite accidentally, in the course of a hurried walk of less than two miles over the hills between Balta Sound and Haroldswick, and I have even known of nests in the ploughed fields. The favourite breeding-ground in the neighbourhood of Balta Sound is situated about half a mile inland, at the foot of a range of steep hills, and with a large extent of cultivated land lying between it and the sea. Nests upon the hills are invariably found in the bare gravelly patches which so frequently occur among the stunted grass and heather, a preference being shown to the vicinity of water, even though the quantity be barely sufficient to glisten in the sunshine. A perfect nest consists of a saucer-shaped hollow scraped in the ground, lined with small stones, which are sometimes so thickly piled round the sides that the eggs are found standing almost perpendicularly upon their small ends. Upon the beach, broken shells are often substituted for or mixed with the stones. Like the oystercatcher, the ringed plover will frequently make more nests than it requires for use, and three or four may sometimes be found within a few yards of a sitting bird. Occasionally the presence of a large stone or a root at the bottom of one of these hollows shows sufficient cause for abandonment, but it often happens that these barren nests are carefully lined and finished. The cavity of a perfect nest measures from four inches and a half to five inches across, according to its depth, the deepest being of course also the widest. A few years ago, near the spot above mentioned, about half-a-dozen pairs occupied a piece of ground of about four hundred yards in length by as many in breadth. One winter a number of men commenced digging out and removing the numerous scattered stones, leaving the ground much cut up and full of small holes. Upon the return of the breeding season, the little colony, instead of being scared completely away, merely shifted about three hundred yards southwards, a position which it still continues to occupy. In the spring of 1859 I found a solitary nest near Swina Ness, and watched it until the four young birds were hatched, when the nest was deserted for the remainder of the year. The same thing happened the next spring; and even the next to that, after which I never saw the birds near the spot again; thus I became acquainted with two important facts in the history of this species,—first, that it will return annually to the same nest; and secondly, that it is single-brooded, although fresh eggs are to be found from the middle of April to the beginning of July. The sitting bird usually runs from the nest instead of taking wing, but no one seems to have clearly made out

whether or not it alights at a distance from the nest upon its return, as the sky lark does. I remember, however, accidentally disturbing a ringed plover from its nest one snowy morning early in May. The bird, as usual, ran directly away, the foot-prints thus made being the only ones upon the otherwise undisturbed surface of the snow in the immediate vicinity of the nest, although there were numerous others in all directions a few yards distant. After remaining in a neighbouring cottage for about ten minutes, during which time no other shower had occurred, I returned to the nest, and there found the bird upon the eggs, the return track being visible to the very brink."—P. 164.

I think Dr. Saxby scarcely states the case of the turnstone fairly as against Macgillivray, when he says it is a matter of surprise that so careful an observer should have regarded the alleged stone-turning habit as a fable, for the learned Professor only says he had *nearly* given up the alleged habit as a fable, when he read Audubon's account, which he quotes at length, and which is so circumstantial that it sets the matter completely at rest, a point of which Macgillivray no longer expresses a doubt. Dr. Saxby has also been an eye-witness of this act; he says, "I have watched these birds for hours at a time, and besides witnessing the act repeatedly, have afterwards visited the ground, where the displacement of stones and shells, and even the completely reversed position of some, has been quite sufficient to prove the existence of the habit in question." The breeding habits of the turnstone are admirably described in the paragraph which follows, and leaves nothing to be desired.

"For years after this I was sadly tantalised by seeing turnstones about the shores of Unst during the breeding season, not small flocks which merely waited until summer was well advanced, but pairs which lingered about particular localities. It was seldom, however, that the pair were seen together; the male might be feeding upon the beach and the female several hundreds of yards away upon the rough stony ground. The most likely place of all seemed to be between Skioting and Clugan, and to this spot I directed my attention more particularly. It was a peculiarly wild spot, quite out of the way of the people's track to and from their cottages and boats, and so far as I could imagine well suited to the breeding habits of the birds. The ground is rough and quite uncultivated, backed by stony hills, and gradually sloping towards masses of weather-worn rocks, which form a barrier, preventing the encroachments of the sea. Where the vegetation gradually ends the ground is very irregular and stony, tufts and patches of long rank grass apparently offering most suitable nesting-places. On the evening of the

16th of June, observing a female turnstone behaving very suspiciously, I searched most minutely among the grassy depressions and hollows for more than two hours, and was wandering almost in despair upon the gravelly and stony edge which had been washed bare by the winter's spray, when to my delight there lay three eggs in a hollow among the stones, slightly sheltered from the north by a flattened fragment which partly overhung them. The hollow, which had evidently been artificially formed, was scantily lined with dry grass, and measured a little less than five inches across. I was rather surprised that the bird displayed no anxiety; possibly she was watching me from some concealed position, and would have been bolder had all four eggs been laid and incubation commenced; but at any rate I saw nothing of her for about an hour previously to my discovery of the treasure. Although I had not the smallest doubt that the eggs were turnstone's,—indeed they could have been nothing else,—I thought it best to take one egg, intending to return cautiously next evening, and perhaps see the bird leave the nest. However, early in the morning a man came with the very two eggs to claim the reward I had offered, and although he seemed much aggrieved by the charge, I am quite sure the rascal had been watching me. Two of the eggs were a good deal like the figure in Mr. Hewitson's work, but the ground colour of the third was of a brighter green; all were blotched with umber-brown, reddish brown and purplish gray, the markings of the latter colour being smallest. The average length was one inch and six lines, the breadth one inch two lines."—P. 171.

To myself, who have never witnessed the feeding habits of the oystercatcher, it has always been a puzzle how the bird could detach the limpets from the rock; I never supposed that the oystercatcher fed on oysters, and Dr. Saxby has done nothing to remove the impression that the name is simply the result of a fable. In my occasional visits to the sea-shore I have never seen oysters exposed to the gaze of an oystercatcher, or to my own gaze either; but limpets are certainly so exposed, and as certainly fall a prey to this ingenious bird. Whoever has collected either limpets or sea anemones for an aquarium must have discovered the fallacy of "hammers and mallets and chisels tipped with cold steel." If you would remove these creatures from the rocks without injury, you must take them by surprise, and therefore at a disadvantage; a sudden tap or push is sufficient, but it must be rapid and decided, otherwise the intended victim tightens himself to the rock and bids you defiance. The oystercatcher knows all this, and is far more expert than you can possibly be in carrying the limpet's citadel by storm; "nevertheless," and now I am quoting Dr. Saxby,—

"Those birds which I sometimes see in confinement always place the limpet with the shell downwards, and then, running the bill round the inner margin with a peculiar tremulous motion, detach the animal as rapidly as I could with a knife, and far more neatly. I have never seen them use the foot to assist the operation."—P. 175.

We learn here that oystercatchers, like the dotterel, may be readily domesticated and converted into kitchen pets; in which case it is well to know they need not be confined to a limpet, much less to an oyster, bill of fare, but will be contented with a "diet of worms," or even occasionally a sop of bread and milk or the yelk of a hard-boiled egg.

"A few years ago, returning in a boat from an egg-seeking excursion, I was surprised to hear a sound exactly resembling the cry of an oystercatcher, but much weaker, proceeding from the handkerchief in which some eggs were tied, and, on examination, found a very handsome egg just chipped by a young bird. I kept it warm in my hands, and on reaching home placed it in wool before the fire. It liberated itself in a few hours, and immediately began running about the kitchen floor, soon afterwards picking up bread soaked in milk, and the yelk of hard-boiled egg. A neighbour, to whom I gave it, soon 'lost fancy' for it, and the poor thing was starved to death."—P. 176.

I am well pleased to meet with a short paragraph on the drumming of the snipe; it is one of the subjects that has been a kind of "bubblyjock" with ornithologists: if you express a doubt as to how it is occasioned, the invariable reply is, "Oh! don't you know *that*? I thought everybody knew *that*!" and then follows a solution which is little more than a conjecture, and which conjectures agree in nothing but differing from each other. The following note by the editor of the 'Birds of Shetland' is interesting, and accords with my own views; and I may add that although this drumming has generally been treated as peculiar to the snipe, I believe that several other birds occasionally exhibit an analogous phenomenon. I may remark that in this, as in other cases, the editor has exhibited his intimate acquaintance with bird-life, and a perfect fitness for the task which, through the lamented death of a beloved brother, has thus unexpectedly devolved on him.

"Many years of isolation from the old work must plead my apology with the well-informed reader, if the point be—as is very possible—now regarded as settled beyond all need for remark; but perhaps it will not be unduly intrusive if I subjoin an extract from my own notes on this subject, somewhat more in detail, written in Shetland in 1854:—'I have carefully

watched the snipe upon the wing, to observe their flight, while making the peculiar 'drumming' noise. The drumming is always preceded by a sharp call several times quickly repeated, on the cessation of which the bird instantly makes a diagonal swoop in its flight, the wings vibrating with rapidity during the continuance of the sound. At my brother's suggestion, I have imitated the sound with tolerable accuracy by sweeping round at arm's length a large quill-feather, as of a swan or eagle; if held tightly in the hand it will produce much the same noise by its tremulous motion as the edge cuts the air. I am hence led to conjecture that the sound is caused by the bird setting its wings rigidly at the conclusion of its note, and letting itself shoot ahead with its previous impetus. We many a time spent an hour, on the side of Vallafjeld, motionless in the heather, studying the ways of the snipe, with the aid of a telescope, and then tried our great eagle's feathers, borrowed for the purpose, with the sound fresh in our ears. The result was convincing."—P. 204.

In some respects the fancy names, indicative of habits, which have been assigned to families or groups of birds are not entirely satisfactory, because the habit or peculiarity that suggested the name frequently appertain with equal force to species not included; this is the case with the word *Natatores*, or swimmers; thus, amongst the *Grallatores*, or waders, are many species which, as I know from personal observation, exhibit the faculty of swimming equally with those which exclusively enjoy the name indicative of that accomplishment. Who that has ever watched the little phalaropes, buoyant as corks, or the coots, or the waterhens, but will be quite willing to admit this? The purple sandpipers would seem another example, and, if I mistake not, its natatorial powers have already been recorded in the '*Zoologist*:' be that as it may, the following passage is ample evidence of their existence:—

"The purple sandpiper is an excellent swimmer. In calm weather I have seen three or four, belonging to a larger party, swimming actively about the base of a rock upon which their companions were feeding. I never saw one dive except when wounded and closely pursued. Sometimes, when I have disturbed one on a calm day, it has taken wing, and has deliberately alighted upon the water several yards from the shore."—P. 213.

Another word or two on this species may be quoted with propriety:—

"As they generally take the seaward side of the rocks, they are not easy to be seen from the shore while thus at rest. So little fear of man do they

show that occasionally it is difficult to alarm them; provokingly so now and then when one wishes to obtain a specimen, and the bird, refusing to rise, stands quietly with its head upon one side, as though it were highly amused at such an amount of 'clucking' and gesticulation. In fact, the little monkeys sometimes turn the tables upon you altogether, for you can't shoot a bird when it is pleased to see you."—P. 213.

In this place I must introduce a long extract on the breeding habits of the rednecked phalarope, or dearganallt. Dr. Saxby has enjoyed perhaps better opportunities than any other of our ornithologists for observing the domestic arrangements of this dear little bird, and no one will doubt that of these opportunities he has availed himself to the full. We also find, at p. 329 of Mr. Gray's 'Birds of the West of Scotland,' some notes on the same species of so interesting a character that I need make no apology for introducing them here, although the site of the observations is somewhat different. It seems that there are four or five breeding stations of the rednecked phalarope at the Long Island on the Outer Hebrides, the most numerously frequented of which is Benbecula, where from ten to twenty pairs are annually found haunting the little lakes that abound in that island. There are also several stations in the islands of North and South Uist, frequented by at least other twenty pairs, so that the entire dearganallt population on these three islands may be reckoned at something less than fifty pairs. The time of their arrival varies a little according to the season; generally, however, the stations are occupied by the last week in May, and the nests formed in the first week in June. About the first week in July the families gather together preparatory to their departure, which is also to some extent regulated by the state of the weather; but as soon as August sets in young and old have entirely disappeared. In connection with this information as regards the rednecked phalarope in the Outer Hebrides, the following respecting the same species in Shetland cannot fail to interest the readers of the 'Zoologist.'

The scene is laid in a nameless locality in some marshes and low meadows about a quarter of a mile from the sea: the name of the locality is withheld purposely, that it may remain unknown "to the skin-and-egg-shell-fancier," as Dr. Saxby prettily describes those who would be most likely to profit by the information; but he thinks, and I most cordially concur in the sentiment, that the good ornithologist will scarcely find much fault with his reticence.

A rushy spot about a hundred yards in length is the only one where the birds are seen. For a time Dr. Saxby was unsuccessful in a kind of desultory search in this "rushy spot"; but, convinced that eggs were to be found, he put on his considering cap, and standing up to his knees in mud and water, determined not to leave a single stone unturned,—that is, a single square yard unexplored,—until the prize he so ardently coveted was safe in his possession.

"Now at the other end of the swamp, where there seemed to be no birds, was a quantity of drier ground covered with moderately long withered grass, and intersected in every direction by numerous irregular natural drains, some not more than three feet wide, others as many yards, but all forming a net-work so close and intricate as to leave no piece of dry land larger than ten or twelve feet across. Again I set to work, not it is true with any great hope of success, because I had fully resolved to examine the whole of the swamp, so that in case of failure there might at least be no after reproaches. Very soon I discovered what my error had been. First, I found a rough sort of nest, composed of dry grass, too small and too deep for a dunlin's, therefore in all probability that of a phalarope; then within a few minutes I discovered two more nests newly commenced, but no eggs. Shortly afterwards I picked up the broken shell of a newly-hatched egg, then fragments of three others, and close beside them a perfect nest. I carefully packed the fragments in a chip-box, in order to convince sceptics, and then noted down the description of the nest. It consisted of nothing more than a cavity low down among the tall grass, deep in form, and rather neatly lined with blades of the same, most of which were broad and flat; at the bottom they formed a bed almost half an inch in thickness; from the upper surface of this bed to the rim of the nest the height was nearly three inches, the width across the inner rim a little less than two inches. Very shortly afterwards a male phalarope rose unexpectedly and alighted in the water about ten yards off. Marking the spot as closely as possible, I floundered through the muddy water, scrambled upon the little island, and soon afterwards, to my intense delight, discovered a nest and four beautiful eggs, all lying with their small ends meeting in the centre. They were hard-set, but for all that they were a most valuable prize. The nest only differed from the last in having a few feathers, apparently from the breast of one of the birds, lying loosely inside. After this I quartered about for a considerable time, and in the best of good tempers. I found some more half-finished nests and a few more deserted ones, and finally I discovered yet another nest containing four eggs, and another with a single one, all quite fresh. Oddly enough, in this part of the swamp I saw but the one bird already mentioned, while in the further part, among the rushes, they were, as I have stated, abundant. I can only account for

this by supposing that they had young ones which they had led away for concealment, and that the few birds which had eggs must have escaped my notice.

"The fresh eggs found in the second nest are of a pale yellowish olive-green, spotted all over, but rather more so at the broad end, where the marks are also larger, with shades of brownish and purplish gray and deep umber-brown. All are of a lengthened pyriform shape; three measure one inch two lines in length by ten lines in breadth, but the fourth is one line longer and one line narrower. Those of the first set are not quite so sharply pointed; the ground colour is warmer, and the markings are of a redder tinge. They all measure one inch three lines by ten lines. The single egg is of the exact size of the three last described, but the ground colour is darker and greener, and some of the blotches at the broad end are very large. These apparently over-minute particulars are worth recording, because a single difference in colouring or a variation in measurement, more or less, is often supposed to be quite sufficient to decide a dispute as to species. The peculiar appearance of phalarope's eggs is owing to the roundness and distinctness of the markings, which for the most part are scattered all over the surface, instead of being confined chiefly to one end; the distinctness of the markings is owing to the comparative scarcity of under tints.

"While wading in the swamp the first indication I had of the presence of the birds was the peculiar note heard, singly at first from one individual, but afterwards it was echoed from all sides by numerous voices. I scarcely know to what the note can be likened, except to the word 'gulp' uttered rapidly several times in succession, and then after a pause again repeated. This seems to be common to both sexes, but as they take wing the male utters a sharper cry. Often when closely pursued in the water they utter a loud chattering noise, at the same time swimming almost as fast as one can wade. The note of the young birds is nearly similar to that of the old ones, and in fine weather it can be heard distinctly when the birds are flying so high as to be almost out of sight. Sometimes they fly very rapidly, but when anxious to return to the rushes they proceed by means of a number of short jerks with the wings, and then drop suddenly. As they fly overhead the wing appears to form a sharper angle at the carpal joint than I have observed in the sandpipers. Rednecked phalaropes seem to entertain but little fear of man, and even the hateful gun itself often fails to terrify them. It sometimes happens that when large shot is fired from a distance at one sitting in the water it escapes untouched, although in the very centre of the charge. On such occasions I have seen it, so far from being alarmed, rise for the height of two or three feet, and after hovering over the disturbed water for a few seconds alight again in the very same spot. Their behaviour is sometimes quite unaccountable, at least to myself. One day early in June, following up the winding course of the broad quiet burn which flows

through the marshes, I suddenly observed a pair of phalaropes close together near the bank, partly concealed by the marsh marigolds, and never for a moment at rest, now swimming rapidly out with a pretty nodding motion of the head, and next moment threading their way among the tall stems of *Equisetum*, occasionally darting forward to pick some floating particle of food from the surface. Thinking to obtain them both, I fired. One, the female, fell over dead, the other fluttered to the land, as I thought, mortally wounded. So heavy was its flight that my companion immediately gave chase, making sure that he should catch it with ease. He pursued it for a considerable distance over the grass, more than once nearly getting his hands upon it, when suddenly, to his dismay as well as my own, it rose and flew vigorously towards the loch, where it went quietly down among the thick herbage and was lost to us."—P. 216.

EDWARD NEWMAN.

(To be continued.)

Notes from Castle Eden. By Mr. JOHN SCLATER.

(Continued from Zool. S. S. 4070.)

JUNE, 1874.

A hen pheasant was seen carrying a bird in her mouth, sometimes laying it down and pecking it; she had left off before I could witness it, but on going to the place as directed I found it was a hen sparrow newly killed.

Blackbirds and thrushes are suffering severely from the drought; they are so weak that the high wind of the 11th instant killed a great many full-fledged young by blowing them about: they all have the same puffed-out, starved appearance as in hard winter weather. In the woods, where the oaks are being felled and barked, the thrushes that have young to feed may be seen hopping and running amongst the work-people's feet, on the look-out for worms, &c.; they can hardly be made to take wing. Both species are particularly numerous this season, principally owing to the ambiguity of the Wild Birds Protection Act to the boys in this dark region.

There are perhaps few readers of the 'Zoologist' who have not seen the awkward, clumsy chase of the sparrow after the cabbage-butterfly, showing how ill adapted that bird is for such pursuits. The other day I saw the most laughable instance of this kind I ever met with—a pair of sparrows trying to capture a rather

small moth: they once ascended nearly perpendicularly not less than eighty feet, when the moth quickly took to a tree for shelter, the sparrows still following, and after some beating about amongst the branches the moth was again driven into the open, and the male bird, who was first in the chase, commenced screaming open-mouthed (from vexation, I thought). The moth finally escaped by slipping into a narrow crevice in a wall; the bird clung to the wall, and struck his bill into the crevice several times, screaming harshly, but was obliged to give in, fairly beaten. I was not aware that the house sparrow ever made an attempt to sing. I was sitting at an open window when I heard a low twitter, very like what young canaries just leaving the nest may be heard making when half asleep. I had seen the bird just a minute or two before, enjoying a bath and hop upon a branch to preen his feathers. I could not have believed it had I not seen the motion of his throat at the same time.

It is not often anything good can be said of the wood pigeon. I was told that they were making sad havoc with the turnips in a certain field; consequently I went to shoot them. By waiting behind a fence I soon shot eight, and then sat down to open their crops. I did not find a trace of turnip in any of them; they were all crammed full of the unexpanded flowers of charlock, or "runch," as it is called in this part of the country. In this case, then, the pigeons were conferring a great benefit on the farmer instead of the great damage he accused them of, simply because he saw them in the field. It must not be understood, however, that they will not destroy young turnips, as I have known plenty of instances of their doing so. Walking on, I met others coming from the direction of a pea-field, and was curious to examine some of them also. I succeeded in bringing down three, and on opening them found they had all fed on pea-pods: the pods were perfectly flat and empty, and had been broken into four or five irregular pieces. I took the trouble to fit the pieces together from one crop, and found it contained nine pods and some odd pieces. What a mixture of good and evil between these two batches of birds of the same species, living in the same wood. I could not help reasoning that as some of us prefer to drink coffee, some tea, to breakfast, why should not these birds have their tastes as well as well as we. They are perhaps more destructive to peas than to anything else, as they attack them in all periods of their growth.

I have found the undeveloped tops of the flowers of the lime and plane trees in the crops of their young when taken from the nest.

In the spring I was puzzled to account for the great destruction of the primroses all round this place and in the Dene: they appeared to have been simply pulled off the stem and left lying on the ground. At first I blamed the children, as I have often seen them stringing the flowers together for necklaces; the gardener declared it was the rabbits; then I thought of mice; and so on. It was, however, soon settled, for the same thing was seen in a garden, where at least neither children nor rabbits were admitted. Watch was kept, and it turned out that the greenfinches and sparrows were the guilty parties, chiefly the greenfinches, which are far more destructive than the sparrows, particularly amongst the sprouting crops. I have watched the greenfinch pull up fully a yard of drilled turnips at a meal, eating only the small leaflets [cotyledonous leaves] and seeds, leaving the stems scattered along the line like clippings of silver wire. I have often wondered how birds can draw these seeds out of the ground, especially when it is dry and hard, without breaking the stems. I find they invariably break when an attempt is made to pull them with the finger and thumb. It is curious, too, how seldom one can succeed in drawing a worm without breaking it, and how easy it seems to a thrush or blackbird; although, by the bye, I remember once seeing a thrush fail in trying to draw a large worm, when a blackbird made a dart at it, causing the thrush to leave off, and drew it at once, possibly from his superior strength, or because the work was already half done. I ought to have mentioned that only the green part of the primroses at the top of the stem were eaten—I suppose, from its containing the nectar.

I was walking leisurely down the Dene when I felt a smart slap on the cheek. I observed the object fall to the ground, and looking down I saw something spinning round, which on closer examination proved to be a large bluebottle fly and a wasp stuck to it, busily engaged in cutting off the fly's wings, which it soon succeeded in doing, and then commenced to eat it.

JOHN SCLATER.

Castle Eden, Durham.

Ornithological Notes from North Lincolnshire.

By JOHN CORDEAUX, Esq.

(Continued from S. S. 4063.)

JUNE, JULY AND AUGUST, 1874.

Brownheaded Gull.—June 15. Young birds of the year first seen on the flats. On the 16th I saw from four to five hundred, all adults, on some freshly-broken upland; they were basking in the hot sunshine, reclining in various positions, some busily engaged in preening their feathers, others dusting themselves in the dry soil like partridges, but the greater part were sleeping with their bills tucked away beneath the scapularies: every one of these birds I believe were adult. They will resort every day to the same place, resting for hours in this manner during the heat of the day. In time the land becomes covered with their feathers, as if a flock of geese had been plucked upon it.

Spotted Flycatcher.—I have not seen a single flycatcher in this neighbourhood during the summer. It is usually very common. Two pairs which have now for many years nested in my garden have not shown themselves this season.

Redlegged Partridge.—This bird is becoming quite common in that part of South Lincolnshire bordering the Wash and opposite the county of Norfolk. I am told it has of late years gradually extended its range in that district.

Dunlin.—July 13. A considerable flock, in summer plumage, on the river flats.

Whimbrel.—July 14. Seen and heard.

Great Blackbacked Gull.—July 17. Some old birds, with their young, have returned to the sea coast.

Mistletoe Thrush.—July 24. Have already congregated. In the last week in the month I daily met with large flocks amongst the heather and mountain sedges on the highest portion of the Shap Fells in Westmoreland, and on the still higher fell ranges at the head of Swindale and Wet and along Sleddale.

Oystercatcher.—July 28. There was an oystercatcher to-day swimming on one of the loneliest and wildest of our English lakes. It rose from the beach and alighted in the water some distance from the shore, swimming with all the grace and ease of any other water-fowl, sitting, however, very high in the water.

Dunlin and Ringed Plover.—August 3. Large flocks, mainly composed of young birds, in the marshes.

Curlew.—August 3. Many young of the year in the grass marshes near the Humber.

Knot.—August 18. There were young birds on the flats as early as this date.

Terns.—August 21. Terns are partly crepuscular in their feeding, and in the twilight have a wonderfully keen sight for any small floating object. This evening, when a few miles from the mouth of the Humber, we had scores beating for food round the yacht. It was so nearly dark that on looking over the bulwarks I found it was impossible to distinguish any small floating object, yet terns were dropping in rapid succession, one after the other, from the height of twenty or twenty-five feet, and seizing some small fish or floating object near the surface. The sea was highly luminous, and it may be that each little fish, as it dashed to and fro, carried its own lamp, a real danger-signal in this case, guiding the graceful sea swallow to its supper. A pleasant sight it is, on a bright summer day, with a smooth sea, to watch a flock of terns fishing, beating here and there, and examining every yard of water, like pointers quartering a field; now one, then another, remains momentarily suspended on motionless wing; then there is that rapid dash downwards and the splash in the green sea, the bird rising almost instantly with a small glittering fish held crosswise in its bill; this, before it is bolted, requires properly adjusting, head downwards, and I have often been amused at the efforts made by the bird to get the fish straight for its gullet, often dropping it three or four times in succession, and by a sudden downward dash recovering it in mid-air. It is rarely the fish reaches the water again, and then so battered and pinched as to be readily retrieved.

Redhoated Diver.—August 21. One seen off the Spurn.

Great Skua.—August 21. I saw this noble, but now unfortunately rare, bird some miles out at sea this afternoon, in chase of a lesser blackbacked gull, which it fairly drove down on the water, and then seemed reluctant to abandon its pretensions. Since this date I have passed over nearly a thousand miles of the North Sea without coming across another example. Richardson's skua is not uncommon, and at this season may be found all along our east coast.

Turnstone.—August 22. I shot a young bird of the year at Spurn this morning, and saw others.

Godwit.—August 22. Small numbers of godwits on the mud-flats to the north of Spurn.

Curlew Sandpiper.—Common as this species was in our marshes and on the coast in the autumn of 1873, I have this season not come across a single example. In the third week of September I saw a flock on Sandy Island, close to Heligoland.

Guillemot.—August 22. This morning guillemots were diving and fishing close to the yacht; they kept so near the surface that sometimes every motion of the bird was visible, and the direction they took apparent both by the long lines and furrows made as they rippled the oily surface of the sea in their rapid passage underneath, as well as by the many little glittering fish jumping from the water to escape capture. There were also numerous porpoises very slowly and lazily rolling, often with the whole of their backs exposed, as if desirous of feeling the full blaze of the morning sun. Above the porpoises a flock of lesser blackbacked and herring gulls screamed and fluttered, making rapid dashes at the fish, which the unwieldy sea-pigs drove to the surface. Sometimes a big fellow made a sudden dash forward, furrowing and ploughing the water with his snout, whilst scores of little frightened fish, like jets of liquid silver, sprang to right and left to avoid him. The sea this morning seemed alive with life, literally swarming with the fry of various fish.

JOHN CORDEAUX.

Great Cotes, Ulceby, Lincolnshire.

September 30, 1874.

Ornithological Notes from Devonshire, Cornwall, &c.

By JOHN GATCOMBE, Esq.

(Continued from S. S. 4105).

MAY, 1874.

5th. Found some gray wagtails breeding by the side of the river Lydd, near Lifton, Devon, when one of the old birds feigned lameness and used other artifices to entice us away from the vicinity of the nest and young.

11th. Visited the breeding-places of the herring gulls at Wembury, on the coast a few miles from Plymouth, where we observed

about two hundred, all of which, with the exception of one, were apparently in their full nuptial dress, and most seemed to have nests, from the noise and anxiety they displayed, flying round and hovering within ten yards of our heads during the whole time we remained. I much fear some of the nests had been robbed, as we found fragments of egg-shells on the top of the cliffs. The day after, a boy was killed by falling from the rocks when searching for gulls' eggs at a breeding-place near the Rhame Head, on the coast of Cornwall, not far from Plymouth, and I have lately read of another having shared the same fate further to the eastward towards Exmouth. On the 15th I examined an exceedingly fine female of the common buzzard, which was killed near her nest, and I am sorry to say the male has since shared the same fate. The stomach of the latter contained nothing but the remains of rats and mice.

16th. Observed many swifts and a whimbrel. The latter species seems to have been very scarce on our immediate coast during the present month, but swifts, on the contrary, are rather plentiful. A dealer in live birds has had no less than twenty-five young ravens brought to him lately, taken in Devon and Cornwall.

JUNE.

14th. Visited Dozmare Pool, on the Cornish moors, about ten miles from Liskeard, on which were several adult herring and lesser blackbacked gulls: these I was rather surprised to see, considering it was in the middle of the breeding season, and the pool so many miles from the coast. On the grassy margins were several dunlins, some of which I think were breeding, from their extreme tameness, constantly alighting very near to, and then running on before as if to lead us away from, a particular spot; but when closely followed they would fly off, making a short circuit, quickly returning, and constantly uttering the curious trilling pipe peculiar to the breeding season. These notes were frequently heard, apparently close by, when we could not see the bird; but on carefully noting from what direction they came, we were sure to find it, generally standing bolt upright on some little eminence among the grass, watching us intently and uttering its cry all the while: on our approach it did not fly, but ran or walked off until we came too close, when it would take wing, making a short circuit as before. At another part of the pool I observed a small flock of five or six together. Indeed, I could hardly have believed that a dunlin when standing erect could have

appeared so tall, the neck at times being so stretched as to bring the whole body in an almost perpendicular line. All these birds were in perfect nuptial dress, very ruddy on the back and a large patch underneath. On the moors were many whinchats, black-headed buntings, and a few curlews. Whinchats, I am told by a friend, are very plentiful in Wiltshire this season, and I observed several perched on the furze-bushes by the side of the line on my way to Epsom from London Bridge, in June.

18th. A greater spotted woodpecker was brought to one of the Plymouth birdstuffers to-day, also a young one of the green woodpecker in its prettily barred plumage. The Sound appears full of herring and lesser blackbacked gulls fishing in flocks, most of them, I should say, non-breeders, for when the tide has receded a large number may be seen resting or feeding on the mud-banks for hours together, far away from the breeding haunts. I have, however, lately remarked that when a large number of gulls were congregated at the sterns of the men-of-war, picking up the scraps thrown overboard after the dinner-hour, that they made the same noise that they do at the breeding-stations.

JULY.

14th. Visited the river Tamar, near Lifton, and was much pleased to find several pairs of sand martins breeding in its banks. I also observed, in a small stream adjoining the river, a common sandpiper, which it appears had already left its breeding place on the moors, and was making its way towards the coast. Examined the contents of the stomach of a nightjar, which consisted of between twenty and thirty almost perfect specimens of a small kind of cock-chaffer [*Amphimalla solstitialis*], besides many moths and beetles.

15th. Heard the notes of many whimbrels and sandpipers passing over the town after dark.

19th. Cormorants are now leaving their breeding stations, and may be seen flying up our tidal rivers in small flocks, where they remain to fish during the greater part of the day: they sometimes rest on the mud-banks for hours when the tide is out. The nuptial dress of this species is lost very early.

23rd. Visited the breeding place of the herring gulls at Wembury, near Plymouth, and found that most of the young had left their nests and were congregated in some small groups on the grass on the top of the cliff, but on our approach were quickly

called off by the old ones, which did not, as at the commencement of the nesting season, fly round screaming close to our heads, but mounting rather high in the air, seawards, commenced wheeling and kept up an incessant cry until all the young birds which could fly were enticed off and settled by themselves in flocks on the water some distance from the shore. A few young ones, not yet able to fly, were standing just outside their nests, but on seeing us soon hid themselves in the holes and crevices of the rocks. When watching the gulls we saw ten ravens, which flew by in one flock. There were also many common buntings on the walls and hedges in the vicinity of the cliffs.

24th. Several young herring gulls were fishing to-day in our harbours and estuaries.

AUGUST.

16th. Swifts seen for the last time. These birds have been very plentiful in the neighbourhood of Plymouth during the present season.

20th. A flock of six Cornish choughs were seen by a friend of mine on the rocks at Morthoe, on the coast near Ilfracombe, North Devon.

27th. There were several flocks of Ray's wagtails, young and old, in the meadows near the coast, which is generally the case at this time of the year, before their departure for the winter; there were also many wheatears.

29th. Observed a pair of grayheaded wagtails in a meadow close to Plymouth; but I have remarked that these birds seem to prefer keeping by themselves, and on being disturbed generally fly off in a different direction from the others. Observed a nightjar this evening flying up a back street in Stonehouse, and, strange to say, a few days since one was seen flying over the Plymouth Market: these birds have probably been kept on the coast by the recent heavy gales. A female ring ouzel, in deep moult, was killed near Dartmoor.

31st. Saw the grayheaded wagtail again. The male, although of a fine yellow on the under parts, had a dark spot on the breast, which I suspect is usual after the autumnal moult; the head was pure gray, and the stripe over the eye and throat white.

JOHN GATCOMBE.

8, Lower Durnford Street, Stonehouse, Plymouth.

Ornithological Notes from Dartmouth.

By GERVASE F. MATHEW, Esq., R.N., F.L.S.

SEPTEMBER, 1874.

Avocet.—A friend of mine who lives in this neighbourhood, and who is well acquainted with birds, informs me that one day the beginning of this month he saw one of these curious birds feeding on a mud-bank about half-way between this and Totnes. He was quite close to it, he says, and could not possibly be mistaken as to its identity.

Cormorant.—Sept. 16. A great number in the river fishing off the Flat-Oar Muds and sitting on the banks opposite Stoke Gabriel. I never remember having seen so many together before in this locality, although I was pretty often on the river in the years 1867, 1868 and 1869. To-day I counted as many as eighteen in sight at the same time.

Hérons.—September 16. I saw at least thirty or forty to-day between Dartmouth and Stoke Gabriel, and in former years I never saw so many in one day.

Ringed Plovers and Dunlins.—September 16. Several small flocks of each species feeding on the Flat-Oar Muds.

Kingfishers.—September 16. Appear to me more plentiful than they used to be, as I noticed at least a dozen this afternoon, and a few years ago one seldom saw more than two or three in the course of the day.

Ring Ouzel.—September 23. A friend of mine sent me one of these birds yesterday, which he killed while out partridge-shooting, and did not know what it was. It proved to be a young male of the year, and was immensely fat, and being too much knocked about for skinning I had it cooked, and it formed part of my lunch to-day, and was excellent. My friend tells me he saw several others. These birds breed every year on Dartmoor.

Starling.—September 27. Great numbers about now, and they are beginning to mass in large flocks, and about an hour before dusk may be seen wending their way towards Slapton Lea, where they roost in the reed-beds.

GERVASE F. MATHEW.

H.M.S. 'Britannia,' Dartmouth,
October 9, 1874.

Ornithological Jottings. By C. B. CAREY.

IN January the blackbirds were in full song. The weather was warm, though wet and windy: this leads us to suppose that birds are affected by the weather, for in the frost and snow miserable are the twitters of the half-starved birds. In February they began breeding, for in the first week in March a blackbird's nest was found with three eggs in it. Therefore, if the winter were warmer, should we have the birds singing all the year round? It seems to me that it is not because it is spring that they sing, but because there is then warmth and food; and that in mild winters, there being more food they are less pinched, and consequently sing as they do in the early spring.

In March I picked up a kittiwake, by the beach, where it had evidently been killed by a hawk. The eyes and brains had been eaten out, its leg was broken, and it was wounded in the body. It was in very much the same plumage as that one described by Mr. Cecil Smith in his 'Birds of Somerset,' which was picked up at Crowcombe Heathfield. Its bill was lemon-colour at the tip of the upper and lower mandibles, the rest dark olive. The head was much battered, but the forehead and chin were white, while the top of the head was gull-gray. The breast, tail-coverts, and all the under parts were white. The back, scapulars and wing-coverts gull-gray. The four first quills tipped with black, the outer web of the first one black all the way down. In fact, it was in winter plumage, not having begun to change, though it was the end of March.

In April I saw a Dartford warbler at Couch's shop; it had been knocked down by a stone. I also saw a bullfinch which had been brought in: this bird is much more common in Jersey than it is here.

On the 19th of April I watched the swallows arriving from the south-east: they seemed to have sent some on as scouts, for they flew past by ones and twos every few minutes. They did not stay near here, but went over to the other side of the island, where a day or two afterwards I saw numbers of them. They did not appear here till some time later.

In May an adult male marsh harrier was found in Herm; unfortunately it got into the hands of some person who, I believe,

kept it too long before bringing it over to be preserved, so that all that remains of it is the head.

In July a young Montagu's harrier was shot in Herm: it was brought to Couch to skin: he found a whole lark's egg and also the shell of another in its throat: he showed me how the whole egg was sticking in the empty shell of the broken one. In one wing it had evidently some old unmoulted feathers: they looked more as if they were moth-eaten than anything else. These birds must go to Herm after the game which is preserved there, and this will account for their greater frequency there than here.

The swallows are still with us. I have heard their song several times since I last wrote (S. S. 4156). I also heard the house martins singing when I was in Yorkshire. I think the reason we so seldom hear the song of these birds must be that—with all the other songs of larger birds and with all the noises that there are in the day time—this gentle little song is quite overpowered, and it is only in quiet times, as at dawn, and in quiet country places, that one can have an opportunity of hearing it.

C. B. CAREY.

Candie, Guernsey, October 16, 1874.

On the Nesting of the Golden Oriole in Kent.

By J. E. HARTING, Esq., F.L.S.

(Reprinted from the 'Field' newspaper of October 3rd.)

ALTHOUGH the discovery of a golden oriole's nest in England is not unprecedented, it is of sufficiently rare occurrence to attract the attention of naturalists, more especially when the finder (as in the case to which I am about to allude) has the humanity and good sense to permit the young to be reared, instead of shooting the parent birds the moment they are discovered, and thus effectually putting a stop to all attempts at nidification.

It is a pleasure to be able to record the fact that during the past summer a pair of golden orioles took up their quarters in Dumpton Park, Isle of Thanet, where—the proprietor, Mr. Bankes Tomlin, having given strict injunctions that they should not be disturbed—they built a nest and successfully reared their young, ultimately leading them away in safety.

They must have commenced building somewhat later than usual, for it was not until the 6th of July that I first heard of the nest,

and the young were then just hatched. Mr. Bankes Tomlin having kindly invited me to come and see it, I lost no time in availing myself of his invitation, and a few days later, namely, on July 12th, I found myself at Dumpton Park, standing under the very tree in which the nest was placed. The reader may smile at the idea of journeying from London to Ramsgate merely to look at a nest; but if he be an ornithologist, he will know that golden orioles' nests are not to be seen in this country every day, and that when found they are worth "making a note of." Often as I had seen the bird and its nest on the Continent, it had never been my good fortune until last July to meet with it in England. Indeed, the instances in which nests of the oriole have been found here and recorded are so few that they may be easily enumerated. According to the concise account given by Professor Newton in his new edition of 'Yarrell's British Birds,' one was discovered in June, 1836, in an ash plantation near Ord, from which the young were taken; but, though every care was shown them, they did not long survive their captivity. "Mr. J. B. Ellman says (Zool. 2496) that at the end of May, 1849, a nest was, with the owners, obtained near Elmstone. It was suspended from the extremity of the top branch of an oak, was composed entirely of wool bound together with dried grass and contained three eggs. Mr. Hulke in 1851 also recorded (Zool. 3034) a third, of which he was told that it was found about ten years previously in Word Wood, near Sandwich, by a countryman, who took the young and gave them to his ferrets; and Mr. More, on the authority of Mr. Charles Gordon, mentions one at Elmstead, adding that the bird appeared again in the same locality in 1861. Mr. Howard Saunders and Lord Lilford informed the editor that in the summer of 1871 they each observed, in Surrey and Northamptonshire respectively, a bird of this species, which probably had a nest. Messrs. Sheppard and Whitear speak of a nest said to have been found in a garden near Ormsby, in Norfolk; but the eggs formerly in Mr. Scales's collection, which it has been thought were taken in that county, were really brought from Holland, and the editor is not aware of any collector who can boast the possession of eggs of this species laid in Britain."

The nest which I am now enabled to record was placed in a fork of a very thin bough of an elm tree, at a considerable height from the ground, and almost at the extremity of the branch, so that it was impossible to reach it except by cutting off the branch near the

trunk. Happily, in this case there was no need to reach it, and the finder was enabled to ascertain when the young were hatched by sending a man up the tree high enough to look into the nest without disturbing it. A few days before his first ascent there had been a strong wind blowing for some time, and the slender branch was swayed to and fro to such an extent that, notwithstanding the depth of the saucer-like nest, one of the eggs was jerked out upon the grass below and broken, though not irreparably so. When I saw it, it was in two pieces, but unmistakably the egg of an oriole—in size equal to that of a blackbird, but shining white, with black or rather dark claret-coloured spots at the larger end. It has been carefully preserved by Mr. Tomlin.

As long as his man remained in the tree the hen bird continued to fly round, uttering at intervals a loud flute-like note, and occasionally making a curious noise, such as a cat makes when angry.

It is, perhaps, scarcely necessary to remark that, as regards situation, form, and the materials of which it was composed, the nest did not differ from those which one is accustomed to see upon the Continent. Invariably placed in, and suspended under, the fork of a horizontal bough, the sides of the nest are firmly bound to each branch of the fork with blades of dry grasses and fibrous roots. There is generally a good deal of sheep's wool in the nest itself, which, taken in connection with its peculiar shape, gives it a very singular and unique appearance.

On the 12th of July as we approached the nest in question, the hen bird was sitting, but left as we advanced, and perched in a neighbouring elm, whence at intervals she uttered the peculiar noise to which I have referred. Not wishing to keep her too long from her young, we left the spot in about ten minutes, after carefully inspecting the nest with a binocular. Returning again in half an hour, and a third time two or three hours later, we saw the hen on each occasion quit the nest and take up her position as before at a little distance. Once only did I catch a glimpse of her more brightly coloured mate as he darted between two trees. He was very shy, and silent too, being seldom heard except very early in the morning or at twilight. This, however, is the case with most song birds after the young are hatched, for they are then so busy providing food for the little mouths that they have scarcely time to sit and sing. Mr. Tomlin, who had other and better

opportunities for observing him, gave me to understand that he was not in the fully adult plumage, so that it seems the males of this species breed before they have assumed their beautiful black and yellow colours.

On the 22nd of July the man again ascended the tree and peeped into the nest. The young had flown, but were subsequently discovered sitting about in the park with the old birds. As soon as the nest was no longer wanted, Mr. Tomlin had the branch which supported it cut off, and, writing to me on the subject the following day, he observed, that "upon examining the nest we found the corners tightly bound with long pieces of matting. One would almost imagine that a basket-maker had been at work."

Both the old and young birds continued to haunt the park until the 1st of August, after which date they were no longer seen. The young were, however, well feathered by that time, and able to take care of themselves. Let us hope that they contrived to escape the eyes of prowling gunners beyond the park, and that they will return again next spring to gladden the eyes and ears of their kind protector.

It is much to be wished that other proprietors would follow the good example thus set by Mr. Bankes Tomlin. Could they be induced to do so, they would become acquainted with many beautiful birds which visit us from the Continent every spring, and which would in most cases rear their young here if allowed to remain unmolested. Apart from the gratification to be derived from seeing these brightly coloured birds within view of the windows, and hearing their mellow flute-like notes, they would be found to be most useful allies to the gardener in ridding the trees of caterpillars, which they devour greedily, and keeping many other noxious insects in check.

As some of my readers may naturally ask the question, where do the golden orioles come from, and where do they go, or such of them as escape destruction, on leaving this country? I may anticipate them by observing that these birds make their annual visit to the European continent from the countries south of the Mediterranean in the month of April, and return in September. It is at the end of April or beginning of May that specimens are usually obtained on our southern coast; and from those that pass over France and Germany in a north-west direction an example

is occasionally procured in the maritime counties of our eastern coast.

Those who may desire a little more information as regards the geographical distribution of this handsome species, cannot do better than turn to the account which is given of it in Professor Newton's edition of 'Yarrell's British Birds' (vol. i. pp. 233, 240)—to which account, it will be seen, I have already referred.

Correction of an Error.—I think you have done some injustice to Mr. Yarrell in the last number of the 'Zoologist,' which I am sure you will be glad to correct. Quoting (S. S. 4174) a passage from the revised edition of his book, you say:—"This, however, seems little more than a copy of Macgillivray." Now the passage in question first appeared in May, 1838 ('British Birds,' 1st edition, part vi. vol. i. p. 256), while Macgillivray's account, from which you say it seems to have been copied, was not published until 1839. The slight alteration made by myself in the passage for the revised edition has no bearing on the question of originality, and therefore I need not further refer to it.—*Alfred Newton; Bloxworth, Blandford, October 2, 1874.*

[I extremely regret the mistake, but it seems a very natural one, as the first edition of Yarrell is dated 1843. I trust the publication of Professor Newton's note, for which I am much obliged, will remedy any misapprehension which my observation might have caused.—*Edward Newman.*]

Hairy-armed Bat in County Dublin.—I am enabled to add the County Dublin to the three counties recorded in the 'Zoologist' for July, as a habitat of the hairy-armed bat, having shot a specimen near Glasnevin on the 30th of July last.—*J. Douglas Ogilby; 11, Mark Street, Portrush.*

Lesser Shrews and Bank Voles.—I know not if lesser shrews and bank voles are rare enough to interest you. I obtained four bank voles, one field vole, and one lesser shrew this summer, all in Sparham. Of three bank voles caught in a pitfall, two were immature specimens, taken on the 29th of July and 8th of August respectively; the third specimen, a savage old male, caught on the 13th of August, refused to give up his right to a laburnum seed, fought for it, and followed, squeaking, the hand that took it: this specimen was larger and still more ferruginous than the two immature specimens. An old female bank vole containing five young, brought by a cat on the 20th of August, was larger and redder than the old male; ear six lines long and six broad, the whitish fringe at the back of the ear not quite so conspicuous as in the other three specimens; base of tail covered with long hair like that of the body. Common shrews, longtailed field mice

and field vole, frogs, &c., were also caught in the pitfall. A lesser shrew was caught on the heath on the 14th of June. On the road between Cromer and Felbrigge I saw what I believe to be an oared shrew and a lesser shrew, but was unable to catch either.—*Frank Norgate; Norwich, October 10, 1874.*

Birds in Guernsey.—A female hoopoe, shot near Ronseval Vale parish, was brought to me on the 26th of September, and on the 28th a snow bunting, a female, shot in the new road at Cobo, of which last-named I have only seen this one, for they are remarkably scarce with us this season. Our "close time" expired on the 1st of October, and on the 5th a curlew sandpiper and a common sandpiper, shot near Richmond Barracks, were brought to me—the first specimen of the last-named species I have had since I have been here. On the 7th a pair of gray phalaropes, male and female, were shot off the Sallerie Battery: during the siege of Paris there were a great number about with us, but since then I have not seen any but these two, now in my possession. We have had a few terns about, but they were so wild that there was no getting at them, and they have since all left us. Flocks of geese have passed from north to south-west, but I have not heard of any being shot. I took out of the throat of a young herring gull, shot early on the morning of Thursday last, a great part of a missel thrush; the head and beak, whole, severed from the neck close to the skull; the neck, the heart and entrails, and the flesh off the breast, but no skin or bones, except the skull and neck. The gull had apparently torn off the skin, rejecting the breast-bone, back, wings and legs. I found a few tail and wing-feathers of the thrush with the parts eaten. A very small pipe-fish was in its mouth when shot.—*James Couch; 7, College Street, Guernsey, October 19, 1874.*

Honey Buzzard in Cheshire.—I was taking a walk near Bowdon on the evening of the 27th of May, 1872, when I heard a shot close to where I was, and on looking round I saw a keeper picking up a bird, which turned out to be a magnificent specimen of the honey buzzard. It was a male, and possessed the beautiful gray tinge on the head which Mr. Gould says, in his 'Birds of Britain,' always distinguishes the adult examples of this bird. He had evidently been feeding on a nest of young song thrushes, and having a "regular worry," for the feathers of the forehead contained a number of fragments of the egg of this bird, and on dissection I found he had swallowed two young ones. The sternum appeared to me very small for so large a bird. The locality was particularly suitable for the nesting of this bird, being thickly wooded with a number of fine beech trees, but though I kept a sharp look out all the summer I did not see anything of a female.—*Francis Nicholson; Chesham Place, Bowdon, Cheshire.*

Orangelegged Hobby in Cheshire.—In May, 1873, a very fine orange-legged hobby was shot at Styal, near Wilmslow, by the keeper of Mr. Robert Hyde Greg. It was a female, and in very fine plumage. Though from the time of the year it would seem likely to be in the neighbourhood for nesting purposes, nothing was seen of a male bird.—*Francis Nicholson.*

Autumnal Song of the Chiffchaff.—In the 'Zoologist' for October (S. S. 4199) Mr. Whitaker mentions having heard a chiffchaff singing on the 11th of September, and expresses his surprise at the circumstance. In the neighbourhood of Plymouth, where the bird is remarkably common, I have on two occasions heard its song so late as the first week in October, on the 3rd and 5th, and another entry in a note-book gives September 30th as the last time on which it was heard for the year. I believe it to be one of the latest of our summer migrants to leave us, and know it to be no unusual thing for it to give utterance to a weak song when moving towards the coast. I have noticed the same habit in its congener, the willow wren. May not these tuneful individuals be young male birds of the year?—*T. R. Archer Briggs*; 4, Portland Villas, Plymouth, October 6, 1874.

Chaffinch Nesting in Confinement.—I keep most of our English seed-eating birds in a large open-air aviary, and have been very successful in inducing nearly all of them to breed, with the exception of the chaffinch, until this year, when a pair built a nest, laid eggs and brought forth young. None of my friends who have similar aviaries have had the chaffinch paired, though they have occasionally crossed with other species. When in London I asked one of the keepers at the Zoological Gardens whether he remembered a similar instance, and I found that was not the case, though he did not know why such should not occur. I should like to learn if other people's experience is the same as mine.—*Francis Nicholson.*

[I shall be exceedingly glad to receive communications on the subject of birds either nesting or living in confinement: the nesting of our birds and the state of their young on leaving the egg are subjects now happily obtaining more attention than formerly, and should the proposed enactment against birdsnesting ever become law, our only opportunity of really studying the economy of our birds must be when they are caged.—*Edward Newman.*]

Cuckoo singing at Night.—This is a very common occurrence; in fact, the cuckoos here are a perfect nuisance, they make such a noise all night long, but especially about midnight. In Hampshire also they were very troublesome this year, beginning their cuckooing long before dawn, and between them and the nightingales it was difficult to get any sleep at all. I have often heard a blackbird singing at eleven o'clock at night.—*C. B. Carey*; Candie, Guernsey, October 22, 1874.

White Swallow in Nottinghamshire.—On the 4th of this month I shot a swallow in abnormal plumage. The bird was flying about with a number

of swallows and martins. It was of a beautiful pearl-gray colour, and showed the chestnut mark on the throat, but not so distinctly as birds in the ordinary plumage. First woodcock and hooded crow seen on Friday, October 16th.—*J. Whitaker.*

Gray Phalarope in Cornwall.—Two gray phalaropes were shot here on Friday, the 9th of October: I had not heard of any for some years before. I yesterday took a long walk on our western beach, when I was much struck with the unusual scarcity of birds, only meeting with a flight of eleven turnstones, a few pipits, wagtails, about a dozen carrion crows, two wheatears (late visitors), one kingfisher, a large flock of brown linnets, one cormorant, and a very few gulls. My memory carried me back some thirty years or more, recalling the many flocks of various shore birds I should have seen at that time during a similar walk,—turnstones, ringed dotterels, gray sandpipers, sanderlings, &c.,—but now, alas! how changed. I am at a loss how to account for it.—*Stephen Clogg; Looe, October 17, 1874*

Gray Phalarope in Cheshire.—While walking along the shore near here, on Tuesday, October 6th, I came upon a beautiful little gray phalarope swimming along the edge of some salt water pells behind the sea-wall: it was very tame, and allowed me almost to touch it with my walking-stick. I went again the next morning to see if my little friend was still there, but he had taken his departure. It was in perfect winter plumage.—*Arthur J. Clark-Kennedy; Leasowe Castle, Birkenhead.*

Mute Swan in Guernsey.—I have preserved and stuffed two very fine mute swans (*Cygnus Olor*), male and female, shot on the island, in the Bray Pond, near the Vale Church, on the 7th of this month. The male was seventy inches in length, spread of wings one hundred inches, and weighed seventeen pounds and a half; the female was fifty-seven inches in length, spread of wings ninety-one inches, and weighed fourteen pounds and a quarter. Five others passed over the island on the same day from south-west to north; they were flying very low, and, judging from their colour, were young birds. The specimens I have to preserve are pure white over the back, but the feathers on the belly are slightly tinged with gray. Last Monday, the 21st, I got a very fine adult female kestrel, with fourteen tail-feathers, each feather perfectly tipped with white: the feathers were quite new, as if the bird had just finished its moult.—*James Couch; Sept. 26, 1874.*

The Black Gannet.—Will you allow me to suggest that the piebald gannets mentioned by Mr. Taylor (Zool. S. S. 4199) are only young birds in the ordinary plumage of the second or third year, and no unusual variety at all.—*Cecil Smith; Bishop's Lydeard, near Taunton.*

Buffon's Skua near Falmouth.—Mr. Vingoe showed me last evening an adult specimen of this small skua, which he received from the neighbourhood of Falmouth, and it was reputed to have been killed ten miles inland.

Unfortunately it arrived without its important character of two middle tail-feathers, the elongation of which beyond the lateral tail-feathers I should have been greatly interested in observing, and also whether these feathers *graduated* to a point from the roots, or were of *equal* width throughout, a character which the late Mr. Yarrell thought essential to the true Buffon's or arctic skua. In the specimen which I have, and which is half the size of a Richardson's skua in the same case, the middle feathers exceed the others by *five inches*, but they *graduate* towards the tips: this was reported, with a general description of the bird, to Mr. Yarrell, and he regarded this feature as fatal to its being Buffon's skua. I believe I have mentioned this, or something like it, to you before, but I mention it again, as I think there is some uncertainty, and therefore inviting discussion whether there may not be a still smaller species, and with still longer tail-feathers, and of *equal width* to the end.—*Edward Hearle Rodd; Penzance, October 6, 1874.*

Pomarine Skua in North Devon.—The occurrence of the pomarine skua upon our coasts in the adult state, although perhaps not so unusual an event as it would formerly have been considered, is yet doubtless one of sufficient infrequency to justify its being placed upon record. An instance has recently fallen within my own experience, and inasmuch as it furnished an opportunity for observation of the habits of this species, with which British ornithologists have so few chances of becoming personally acquainted, I think a somewhat detailed account of the occurrence in question may prove interesting to the readers of the 'Zoologist.' Being at Northam Burrows on the 7th of October, I strolled along the coast in the afternoon, about high-water time, and during the prevalence of a strong south-westerly wind. I had not gone far before I observed a large bird swimming, or rather resting, on the water close to the shore, which I at once conjectured to belong to the skua tribe. I observed that it had much more of the body visible above the water than in the case of either gulls or divers when in that position, and the breast seemed unusually full and protuberant. I noticed a peculiar habit which the bird appeared to have of jerking up its head and throwing back its neck at regular intervals of a few seconds between each other. When I had got to within about fifty yards of it, it rose rather heavily, and after sailing about in a slow and stately manner for a short time, pitched upon the shore of a creek some distance off, where it remained for some little time, repeatedly extending and flapping its wings, and I think (although of this I am not certain) continuing the movement of the head and neck before referred to. Having approached it from behind some neighbouring sand-hills, I put it up, and having observed the peculiar hawk-like air with which it looked around it as it rose, I fired, and it dropped winged into the creek; there it sailed about, apparently otherwise uninjured, with its tail elevated after the manner of a moorhen, until I at length secured it. It proved to be a male

bird, and with the exception of the two centre tail-feathers, one of which was shot or broken off and the other injured, is in perfect plumage, the yellow collar around the neck being clear and distinct, and the brown of the back, wings and crown of the head being very rich and deep. The cere is unusually large and prominent; the legs are very hard and horny, and, with the feet, of a deep black, without the slight bluish tint usually noticeable, all these features being clearly indicative of complete or even advanced maturity. Upon my way back across the moor, and about half a mile further on, I came across another specimen of the same species, which, however, did not appear to have been associating with the other bird, and which I had not previously noticed. When first I saw it, it was busily engaged upon the carcase of a dead sheep, and did not seem to be conscious of my approach. I observed with great interest the savage way in which it proceeded with its meal, running at the body, and tearing out the entrails with even greater energy and avidity than is usually displayed by the crows, which make such short work with the carcasses of the many hapless sheep that are worried to death by dogs upon the Burrows. This latter specimen, which I also captured, is in the dark blackish brown plumage of the first year, with the light blue bill and legs peculiar to that stage; the cere, though sufficiently distinct, being not nearly so prominent a feature as in the adult bird, and the two centre tail-feathers being only about an inch longer than the others. I may mention that the recent wild and stormy weather had driven in an unusually large number of gulls and terns, which had been fishing up and down the estuary for some time previously, and into whose labours the skuas would no doubt have entered with zest, had it not been for the untimely termination to their predatory career which I have just described.—*Marcus S. C. Rickards*; 37, *Cornwallis Crescent, Clifton, October 15, 1874.*

Richardson's Skua near Clevedon and at Instow.—I omitted at the time to notice the occurrence near Clevedon of an adult specimen of Richardson's skua, towards the close of last year, I think in the month of December. I saw this specimen in the shop of a birdstuffer, who told me it had been shot whilst flying about some fishermen's nets upon the shore a short distance from Clevedon. The yellow collar was wanting in this specimen, but the purity of the breast and length of the centre tail-feathers (which, however, had partially been shot or broken off) conclusively showed it to be a fully adult bird. Whilst on the subject of Richardson's skua, I may mention that one day in the latter part of August, 1872, when in the birdstuffer's shop at Barnstaple, I was shown a specimen of this bird in the flesh which had just been shot at Instow. It was evidently a bird of the year and in the uniformly dark plumage of that stage.—*Id.*; *October 21, 1874.*

An old Tortoise.—I send you the following, cut from our local paper, the Elkton 'Democrat' of October 3rd, 1874:—"Mr. Joseph Benjamin, of Bay View, exhibited at our office, on Tuesday, a land tortoise having carved upon the under or smooth part of the shell the inscription, 'J. B., 1827.' Mr. Benjamin states that in that year (then a boy fourteen years of age) he recollects having picked up the tortoise in a field belonging to his father, and that he marked it as above with a penknife, and put it down again. After about twenty years he came across the tortoise in the same field, and carried it to his house, and the 'critter' wended its way back to its old quarters. Since then he has seen it frequently, and always took it home, and it, in turn, would go to its old hunting grounds. The tortoise seems not to have increased in size, as it bears marks of having been attacked by a dog at the time Mr. Benjamin first saw it, forty-seven years ago. Mr. Benjamin sets great store by his prize, and says he intends to keep it as a relic of his boyhood. We have often heard of old tortoises, but this is the first one we have seen that could be vouched for." Benjamin is a farmer living near here, and I think there is no reason to doubt the veracity of his statement. The land tortoise is very common here, and I have frequently found them with names and initials engraved on their shells. We also have the "snapping turtle" and "terrapin," both of which are very nice eating, and are common in all our streams.—*Edward Sweetapple; Public Ledger Paper Mills, Elkton, Maryland, October 8, 1874.*

Turtle in Mount's Bay.—A turtle, alive, was yesterday morning taken in a pilehard drift-net, about two miles south of Mousehole Island, in Mount's Bay, a spot well within the headlands of the bay: this would be in about twenty-nine fathoms water, rocky bottom, and the net would be fishing at from two to four fathoms from the surface. Its weight is about seventy to eighty pounds, and it corresponds in all respects with Wood's description of the "green turtle," except that its upper mandible projects slightly over the lower, and neither upper nor lower is (that I, examining it in a show-booth, could see) notched or serrated. The plates of the carapace corresponded precisely with those of the green turtle, and did not overlap, as is mentioned in the hawk's bill. When captured it was covered with barnacles and sea-weed, but showed no signs of weakness. The fore left flapper is partly carried away, but the wound is an old one, or at least is thoroughly healed. I take it for granted that the reptile must have been lost from some ship homeward bound from the West Indies or thereaway; but I note the fact that no ship known to have turtles on board has been lost in Mount's Bay since one in the winter of 1871—2, from which to my knowledge, two living turtles were saved.—*Thomas Cornish; Penzance, October 6, 1874.*

Clausilia Rolphii in Surrey.—As I do not notice any record of *Clausilia Rolphii* having been found in Surrey, and as Mr. Gwyn Jefferys did not know of its occurrence, I think it may be interesting to some readers of the 'Zoologist' to know that I discovered it this year at Mickleham, near Dorking, Surrey, in considerable abundance.—*H. Groves*; 13, *Richmond Terrace, Clapham Road, S.W.*

Zoological Society's Gardens in Regent's Park.—Since my last notice the following animals have been added to the collection:—

Published 1st October.—A Praslin parrakeet (*Coracopsis Barklyi*) and four redercrowned pigeons (*Erythrænas pulcherrima*), from the Seychelles, presented by the Hon. Sir Arthur Gordon; two Burchell's bustards (*Eupodotis kori*), from South Africa; a Hocheur monkey (*Cercopithecus nyctitans*), from West Africa; a Punjaub wild sheep (*Ovis cycloceros*), from N.W. India; two blackish sternotheres (*Sternotherus subniger*), from the Seychelles; an octopus (*Octopus vulgaris*), from the British Seas.

Published 8th October.—Two call-ducks, European, presented by Mrs. Wilson; four little bustards (*Tetrax campestris*), European; a Rhesus monkey (*Macacus erythræus*), from India; a solitary tinamou (*Tinamus solitarius*), from South America; three lesser pintailed sand-grouse (*Pterocles exustus*), from North Africa; two Cornish choughs, European.

Published 15th October.—An Australian rail (*Rallus pectoralis*), from New Holland; a gannet, European; a whitewinged trumpeter (*Psophia leucoptera*), from South America; a dusky monkey (*Semnopithecus obscurus*), from Malacca; a Pinche monkey (*Midas Œdipus*), from New Granada; a bonnet monkey (*Macacus radiatus*), from India.

Published 22nd October.—A chacma baboon (*Cynocephalus porcarius*), from South Africa; a Ducorps' cockatoo (*Cacatua Ducorpsii*), from the Solomon's Islands; two lions from South Africa; a Malbrouck monkey, from West Africa; a sun bittern, from South America; two European rollers; a nakedthroated bell-bird (*Chasmorhynchus nudicollis*), from Bahia; a solitary tinamou (*Tinamus solitarius*), from Rio de Janeiro.

A penguin has also been received, by the mail-steamer 'Neva,' from Brazil; it nearly escaped off Southampton, where it was most imprudently allowed to have a swim in the sea with a string tied to its leg; the string broke, but the liberated bird was fortunately recaptured, and is now safely deposited in the Eastern Aviary. A toothbilled pigeon (*Didunculus strigirostris*) also arrived on the 24th October, and is under the care of Mr. Travis in the Western Aviary, but whether purchased by the Society, or merely deposited for awhile I am unable to say. I hope two birds of such excessive

rarity as a penguin and a *Didunculus* will become permanent residents in their respective compartments.

The Explosion on the Regent's Canal.—This canal passes through the Zoological Gardens, and it is a matter of great interest to ascertain what effect the explosion would have on the collection there exhibited. Of course my readers will at once understand the difficulty of making any accurate and careful observation on the conduct of the animals at five o'clock in the morning, when so few persons would be on the spot, and a time of such extreme alarm and peril, and consequently the unreliable character of any newspaper reports. In reference to the "loud cries" and "dismal howlings" reported as having been heard, Mr. Bartlett, the invaluable Superintendent, has kindly given me the information that he can find no evidence of this; and that he has arrived at the conclusion that none of the animals uttered loud cries or howled during the disturbance caused by the shaking of the buildings and the breaking or falling of the glass. The alarm caused them to run about terror-stricken in the dark, and it was not safe to enter any of the buildings with a light, because that would have caused them still greater alarm; the only thing to be done was to go into their houses and call them, and speak soothingly to them. In almost every instance this had a good effect, as indeed it always has. They recognised the voices of the Superintendent and keepers and stood to listen, and soon their extreme terror seemed to be allayed; but many of the deer and antelopes, which seem to have been more affected than the Carnivora, trembled for hours afterwards, and those which had ventured to lie down again started on their legs on hearing the slightest noise: in a few cases the use of their limbs was completely lost for a time, but in every instance they have now entirely recovered; and not a single death has resulted from this terrible explosion. In the eastern and western aviaries the glass was shattered and fell in showers; as a necessary consequence some birds escaped, and others made their way into compartments not intended for them. The under-mentioned birds are entirely lost, and doubtless will enjoy but a short-lived liberty: we may daily expect to read of them as excessive rarities killed in the vicinity of London:—Two cutthroat sparrows, two paradise Whidah-birds, two Manyar weaver-birds, one rufous weaver-bird, two Java sparrows, one green dove from Japan, one diamond sparrow; and in addition to these escapes, one graceful dove was killed by a toucan, owing to having strayed into a wrong compartment when the prison-doors were opened by the explosion. The following birds also escaped, but were recovered through the vigilance and skill of Mr. Travis:—One glossy starling, one Baltimore oriole, one whitewinged weaver-bird, one bronzewinged pigeon, one hemipode, and one Indian sand-grouse.—*Edward Newman.*

Notices of New Books.

Birds, their Cages and their Keep: being a Practical Manual of Bird-keeping and Bird-rearing. By K. A. BUIST. Post 8vo, 178 pp. letterpress; six plates, one of them coloured. London: Macmillan & Co. 1874.

It has rarely fallen to my lot to receive for review a book got up in better taste than this on 'Birds, their Cages and their Keep.' A query arises, certainly of no great importance,—a query perhaps prompted by curiosity rather than anything else,—Is the book written by a lady or a gentleman? I think it is nowhere stated to which "institution" the author or authoress belongs. In either case it is my duty to treat the said author or authoress with *courtesy*, but in the latter case something more is desirable, for the phraseology occasionally requires *indulgence*.

The work is divided into fifteen chapters, having respectively the following headings:—1, Essentials to Bird-keeping; 2, Cleanliness, and when to Clean; 3, Cages; 4, Situation and Food-vessels; 5, Food; 6, Health and Illness; 7, Red Mites; 8, Breeding; 9, Personal Characteristics; 10, Beneficial Effects of Society; 11, Taming Birds; 12, Performing Birds; 13, Varieties of the Canary; 14, Hints on Foreign Birds; 15, Conclusion. From this list it would appear that no branch of the subject is neglected; but when I inform my readers that fourteen of these chapters are devoted to the Canary, and one only to all the other cage-birds, it will be tolerably manifest that the book itself scarcely fulfils the promise of its title, and still less the requirements of the bird-keeping fraternity. In the estimation of the writer, the Canary enjoys an all-engrossing importance, an importance that would preclude attention to all other birds. K. A. B. is, however, perfectly aware that everyone may not participate in this sentiment, and therefore explains that "although these pages are nominally [?] dedicated to the Canary, it may prove useful to revive a few common-place practical suggestions as to the different varieties of foreign birds that will live happily with our pretty yellow old-established friend." So that it seems that other birds are only to be thought of in reference to their disposition to fraternise with Canaries! But the

writer goes much farther than this: we are told with a kind of dogmatic candour—"My advice to those who are desirous of investing in foreign birds, is the same as Mr. Punch gives to young men about to marry—"Don't"; they are more plague than profit," &c. The spirit of this advice pervades and permeates the entire book, more especially that particular chapter which in its heading professes to treat on foreign birds, and which winds up with the following sentence:—

"In conclusion I can only once more repeat to my reader the advice with which I started—namely, that unless he possess the purse of Fortunatus, the patience of Job, and space and leisure unlimited,—forbear from trifling with foreign bird-keeping, or his hobby will lead him into endless labour, loss, expense, and waste of time and money, over many a hill and dale of difficulty, before he is himself aware of the extent of the mischief and the delusion under which he is labouring."—P. 133.

This may be beautiful writing, tall writing, strong writing, impressive writing, improving writing, but certainly it is slightly discouraging to one who has purchased the book called 'Birds, their Cages and their Keep,' in the expectation of learning how to manage the betcherrigahs, the turquoisines, the rosellas, the Virginian nightingales, the mocking birds, and the innumerable finches and waxbills which gladden his eyes and delight his heart whenever he has the good fortune to visit a true lover of the feathered race. K. A. B. must be somewhat of a visionary to imagine such an one would be contented with "our old-established friend!" As well endeavour to persuade the sportsman to abandon his percussion-cap and fall back on flint and steel; or the traveller to resign his express train, and revert to the "Portsmouth heavy" or the "Darby dilly;" or the merchant to repudiate the galvanic wires, and entrust his message to a relay of couriers with horse-pistols in their holsters and a blunderbuss slung over their shoulders.

Whoever has visited the Western Aviary at the Zoo and witnessed the perfect physique of the exotics,—so bright, so beautiful, so healthy, so happy,—domesticated in that little paradise under the care of Mr. Travis, their thoroughly qualified and most obliging keeper, will never agree with the writer in the sweeping denunciation of foreign birds.

Eliminating such objectionable doctrines, I find much in this little volume with which I most cordially agree; for instance, the

opening sentence is worthy of all commendation:—"No one who has not a kind heart, thoughtful head, observant eye, and gentle hand, has the least right to keep birds." Again: "There are two distinct methods pursued by fanciers in regard to the management of a bird,—one, the most general, to give it sufficiently little attention just to keep the spark of life awake in a long-protracted course of systematic filth, disease, cold, heat, starvation and neglect; the other, to make simple existence such a boundless delight that your tiny *protégé* appears to have learned the secret of perpetual motion as well as that of endless song." Again: "Never forget that intense cleanliness is almost more of an absolute necessity to the happiness, nay, very existence, of chamber birds than even seed and water." This, perhaps, is going a little too far, but still it is in the right direction. Again, in the instructions about cages, the author very pleasantly and judiciously says, "Let the destined occupants be your principal consideration—their welfare, number, size, and habits; and endeavour to choose a home that will serve as a frame and set-off to *their* attractions and enhancement to *their* happiness and conduce to their *health*." The italics are the author's, who goes on to recommend plain German metallic enamelled cages, square and unornamented, because this style of cage, "first and foremost, serves to set-off the bird in a manner none else ever do; then it is an admirable contrast to the ornament and furniture of a handsome sitting-room, let alone the advantage it is in every other respect to its occupant's own welfare, health, and happiness, after all the consideration *par excellence* to the *bonâ fide* bird-lover." The recommendation to exclude draughts, baking hot walls, excessive heat, northerly and easterly breezes, and frosty nights, and the instructions about food, are equally good, and so is the chapter on "Personal Characteristics." From this I shall make a long quotation, in order that my readers may thus become thoroughly acquainted with the writer's style as well as disposition.

"No person, except those who have kept birds for any length of time, and have studied them carefully, could ever suppose or imagine the immense diversity of 'character' that exists even amongst the same species of our domestic and commonest feathered favourites. The contradictory qualities exhibited in an aviary containing only half a dozen birds, affords amusement sufficient to while away many an idle hour. How inquisitive, active, imitative, affectionate, and 'larky' are some! others, again, greedy, selfish,

unobservant, and self-indulgent. I kept one canary eight years, alternately in solitude and society; he was a confirmed hermit in his tastes, preferring isolation to the charms of any companionship whatever. Alone, he was affectionate, lively, and content; in an aviary, he made himself hated by the hen birds, and bullied by all those of his own sex! Timid to a degree, he would be frightened out of his wits by any of his friends opening their eyes at him, whereas his owner might handle him as often and as long as he pleased, without arousing the slightest alarm! His son, on the other hand, was merry and popular in a crowd of other birds of various kinds, as his father was the reverse. Everlastingly feeding or being fed by his neighbours, personally investigating everything, copying the notes of each wild bird he overheard, flying about and singing from dawn till dark, and even after—for gas and candle-light was always the signal for him to commence his droll antics, and wake up the entire aviary. This canary was so irrepressible that nothing daunted him, bursting into ringing song on a noisy, rattling railway-truck, after a long night-journey from the South of England to the Highlands. ‘Study the disposition of your bird; many a good canary has been lost through this being neglected,’ and do not believe people when they tell you that this or that species is ‘always mopish.’ Depend on it poor Dick is sick, dull or unhappy, if he persists in sulking. When in sound health or proper condition, it is perfectly unnatural for any of the feathered tribe ever to be otherwise than absolutely lively and gay, even on dark days, and during moulting.

“We once had the misfortune to lose a hen canary when her chicks were only a week old. Unwilling to let these die, we reared them as best we might until fledged, feeding them once every quarter of an hour by means of a quill containing biscuit, soaked and moistened with yolk of egg and water. One died, and the other lived to be my inseparable companion. Never in his cage except at night, I carried him unfettered everywhere about the house and garden, on hand or neck. He knew my voice so well, that if I was upstairs, he down, and his cage-door open, I had only to call, and whirr—a flutter of wings—and happy Dick was once more in his old place upon my shoulder! His great delight was to perch on the pen with which any one was writing, and do his utmost to catch the flying nib; if successful and rewarded by a beakful of ink, away went Dick spluttering and scolding with rage, and, forgetful of the past, repeat the experiment at the very next opportunity. He was equally fond of prancing about upon the keys of a piano, becoming furious when an octave or scale passage for a moment cut short his amusement. Another favourite trick was to insist on bathing each time he saw me meddling with water, and when dripping wet flying to get warmed and dried on my neck and hair, grumbling with all his might if not allowed. This absurd bird showed a passion for being kissed, the colour and softness of the lips seeming to excite his curiosity,

for the command to 'kiss me, Dick,' was always unhesitatingly responded to. Caress his head, back or wings with the mouth, and he was highly affronted, but a proffered kiss instantly caused him to strain up as high as possible on his toes to comply with the request, which positively appeared to give him delight. I trained him by this means to pay his respects to me, the first thing in the morning, before taking his breakfast. The cage-door was opened for him when he was still asleep, I meanwhile retreating out of sight into Bedfordshire. When I called him, a very drowsy chirrup was the first response, followed by a flight to my pillow, a caress and short speech on his part, and then a return home, to fortify himself by an attack on the seed and water supplies. And at night again it was the same thing; he would perch on his door, sing a small, happy song, crane up and place his beak between my lips, then go back, put 'his head under his wing, poor thing,' and off to the 'land of Nod,' without further notice. He understood as well as possible when he was naughty; for instance, on the mantel-piece stood a valuable fossil, which Dick delighted in pecking at, perfectly knowing he was forbidden to touch it, under any pretence; he would stealthily creep to it, and when driven off, away he hopped, vehemently protesting he meant no harm; then your attention becoming diverted from him by other matters, he would bide his time, return to his prohibited plaything, and triumphantly attract your notice to his work of destruction by shrill calls of defiance. He always uttered this peculiar and unmistakable cry whenever he did anything naughty, never otherwise, as if he appeared to be aware he had no right thus to misbehave himself. It was a remarkable sound, and persuaded those who knew him best that instinct, in him at least, was seemingly very closely allied to reflection or thought, and that he realized the meaning of the words addressed to him. How else did Dick understand he should not peck a fossil when he might a glass vase, or be allowed to dirty his cage and not a book or table?"—P. 82.

EDWARD NEWMAN.

Ornithological Notes from North Devon.

By GERVASE F. MATHEW, Esq., R.N., F.L.S.

I WAS at Instow, North Devon, between the 9th and 16th of September. During that time the weather was very unsettled, boisterous westerly and south-westerly winds accompanied by frequent squalls of heavy rain prevailing, and consequently I was in hopes of finding plenty of migratory birds driven into our river, but was greatly disappointed, as may be seen by the following list. The birds had either not yet commenced their autumnal migrations,

or else the shores of the Taw and Torridge, which, in former years were frequented by great numbers of birds, have become unsuited to them on account of so much of the fore-shores having been reclaimed and enclosed.

Oystercatcher.—Next to the curlew this was by far the most abundant species, and I noticed many large flocks of them. At high tide several flocks assembled together, and were to be found on the "black rocks," close to the water's edge, and could then often be easily approached under cover of a pebbly ridge or the neighbouring sand-hills, but at low water they adjourned to the "Crow" or the rocks in the vicinity of the lighthouse on Braunton Burrows, and at this time were with difficulty to be got within range of. Whilst feeding they keep up an incessant whistling, and seem to be most uneasy in their movements, as they constantly fly from place to place, and never seem to care to settle for more than a few minutes in one spot. They swim with the greatest agility, and a winged bird falling by the water's edge, immediately takes to that element, and generally manages to get far out of reach before the sportsman can arrive. They are by no means to be despised when nicely cooked, and to my taste they almost equal a widgeon.

Curlew.—These birds were plentiful but extremely wild, and were a great nuisance, as it was quite out of the question attempting to get near any other birds amongst which they might happen to be feeding, as, taking alarm long before one was in shot, they rose with such vociferous cries that the tamest birds were frightened and at once took wing. I only killed one, which was a fine bird, fat and in capital condition. One of our Instow boatmen ("Captain" Fishley by name, and a well-known character) recommends these birds to be cooked with a couple of large onions placed inside them; he says they are then "beautiful," but as I have not tried the experiment I cannot corroborate his statement. In the neighbourhood of Bantry Bay, some years since, during the latter part of July or beginning of August, I one day shot four or five young curlews in a boggy heathery spot some distance from the sea, and these when cooked were excellent, and I have no doubt had never fed alongshore. On one occasion, when I was watching some of these birds feeding on the kelp-covered rocks, I observed one of them walking by the margin of a moderate-sized pool, and, after searching about for a little while, it waded into the

water, and, on getting out of its depth, deliberately swam to the opposite side.

Cormorants.—A few noticed every day. At low tide they were generally to be observed sitting on the sand-banks drying their wings or sleeping, but were excessively wary, and would not permit one to approach within shot. The boatman mentioned above, who has a large stock of wonderful stories relating to his shooting and fishing experiences, has frequently told me the following:—One day, when out shooting, he saw an old shag sitting on a spit of sand with its wings widely expanded. He thought he would try and have a shot at it, and, having a large duck-gun loaded with about three ounces of No. 3 shot with him, he succeeded in manœuvring his boat so well that he managed to get within about sixty yards of the bird. He then took a steady aim and fired, and the old shag at first appeared to be perfectly staggered, and “the Captain” imagined he had completely disabled it, and was beginning to congratulate himself on his good fortune, but in a moment or two the wily old shag recovered itself, shook itself well, and then flew off as if nothing had happened. “The Captain” says he felt as if “he looked like a fool,” for he was positive he never missed the bird, as he heard the shot distinctly rattle against its plumage, so he got out of his boat and walked to the spot, and there, just where the shag had been sitting, was the greater portion of the charge of shot lying on the sand, and which the bird had evidently shaken out of its feathers before it flew away!

Whimbrel.—Only two or three seen.

Knot.—Several flocks were generally to be seen feeding on the mud-flats on Islay, but as they were invariably accompanied by curlews there was no getting near them.

Turnstones.—These birds were more numerous than usual and tolerably tame, feeding together in family flocks of five or seven among the kelp-covered rocks. When they fancy they are not observed, they crouch and keep perfectly quiet among the stones until one has passed them.

Curlew Sandpiper.—One day I observed a flock of small birds, which appeared to differ in size and colour from dunlins, and as the day was dull and gloomy, and I could not make them out satisfactorily, I fired and killed one of the outside birds, and on picking it up it proved to belong to this species. This example had not

assumed its winter dress, the feathers on each side of its breast being deeply tinged with chestnut.

Dunlin.—Tolerably plentiful, but in small flocks.

Ringed Plover.—Numerous and wild.

Blackheaded Gull.—One afternoon, when it was blowing half a gale of wind from the south-west, I saw a flock of at least two hundred of these gulls sitting closely packed together on the water in a sheltered bay. They were all in winter plumage.

Tern.—Only observed a solitary example, and this did not come near enough to make out satisfactorily, although I have no doubt, from its size and general appearance, it was *Sterna minuta*.

Kingfisher.—I was agreeably surprised at seeing six or seven of these beautiful birds one afternoon, as I imagined they had all been destroyed in this neighbourhood for ladies' hats, banner-screens, &c.

Common Sandpiper.—Many small flocks feeding in the muddy drains among the salt-marshes.

Redshank.—Only a single example seen. In former years this used to be one of our most common autumnal visitors.

Common Mallard.—Saw a flock of eight early one morning, and should probably have obtained a shot at them, only a passing train put them up.

Teal.—Sailed within shot of two, as they were sitting on the water, and knocked one down as they rose. The other bird hovered for a few moments above its fallen companion before it flew away.

Wheatear.—These birds were far more plentiful than they were in the spring.

Rock Pipit.—Many noticed feeding amongst marine *rejectamenta* at high-water mark.

Peregrine Falcon.—One morning early I saw a fine old male sitting on the beach, busily engaged in devouring a bird. It allowed me to approach within an easy shot before it took wing, bearing its prey away with it, but I did not fire at it, as I have no wish to assist in exterminating such a noble species. I could not discern what bird it was feeding on, as in clutching it to fly off with, it picked up a large piece of sea-weed, which completely hid its victim. It did not fly very far, but soon pitched again and went on with its meal. I fear, from its tameness, it will soon fall to the gun of some prowling bird-killer.

Spotted Rail.—I saw two of these birds one day by the margin of a sedgy ditch in the Braunton Marshes, and, from the number of foot-prints in the soft mud, should say they are numerous in this locality.

H.M.S. 'Britannia,' Dartmouth,
October 8, 1874.

GERVASE F. MATHEW.

Ornithological Notes from Devonshire, Cornwall, &c.

By JOHN GATCOMBE, Esq.

(Continued from S. S. 4229).

SEPTEMBER, 1874.

1st. There was on the mud-flats of the Laira a small party of blackheaded gulls, the first I had seen since their return from their breeding quarters; also nine herons and a great many ringed plovers and dunlins. It is very interesting to observe the last two species rise together in several flocks—when the flowing tide has nearly covered the flats on which they had been feeding—and make their way to the Plymouth Breakwater and Rennie's Rocks, near the Mewstone, where they rest until the water begins to recede, when they return in the same manner to the estuaries and tidal rivers, seeming to know exactly the time when the surface of the mud will begin to reappear. At high tide during the winter thousands of these birds may be seen resting on the Breakwater, and in the autumn accompanied by turnstones, knots and curlew sandpipers, with sometimes a sprinkling of sanderlings. This morning a very large female peregrine falcon was brought for preservation to Mr. Peacock, animal preserver, Plymouth.

4th. Heard many whimbrels flying over the town at night.

10th. Another peregrine, a very small adult male, was brought to a Stonehouse bird-stuffer; also a young turtle dove, killed in the vicinity of Mount Edgcumbe.

11th. On my way to Lifton, Devon, I observed several whinchats on the borders of the moor. The gamekeeper at Lifton told me that sparrowhawks were still very numerous in the plantations of that neighbourhood, and that he had lately killed as many as six in one evening. There are now a great number of golden plovers in our markets, some of them still showing a large amount of black on their breasts; landrails are also plentiful.

18th. Inside the pretty little church in the village of Sheepstor, on Dartmoor, I saw an elegant gray wagtail flitting about on the beams of the ceiling, every now and then descending to the pews, along the tops of which it would swiftly run or start off on wing after a passing fly. I have sometimes seen swallows and a few other small birds in churches, but never before a gray wagtail: the species is not uncommon on the trout-streams close by. The pied wagtail, with (I believe) the titlark, constantly roosts on board boats moored in our harbours for the night.

19th. There were some bartailed godwits in the market. A white sparrow was killed to-day. Many kingfishers have lately fallen victims to the gun, I am sorry to say: one of these beautiful birds, although in fine plumage, was the smallest specimen I have ever seen. Several cormorants have lately been killed, but I have as yet seen no shags, which do not generally make their appearance in our harbours before the beginning of the usual November gales.

OCTOBER.

6th. In the Taunton Museum the curator showed me two young gray phalaropes, in the flesh, which had been killed a day or two before at Stoke St. Gregory, six or seven miles distant: he also called my attention to a kite obtained in June last, and at first recorded in the 'Field' under the name of the "swallow-tailed kite."

7th. Went from Barnstaple to Instow by train, and from thence walked to Northam Burrows, to have a look at the celebrated Pebble Ridge and Westward Ho, returning by Bideford. On my way, by the side of the river, from Barnstaple to Instow I remarked a great many curlews and blackheaded gulls, some godwits, herons, kingfishers, and two green sandpipers, which latter, on being disturbed by the noise of the passing train, rose from a pool under the lee of a small hedge of tamarisk bushes: when on the wing their dark backs and white rumps were very conspicuous. On Northam Burrows there were a great many flocks of starlings, ringed dotterels, and some pied wagtails.

8th. Went by train to Morthoe station, and then walked to the village on the coast, nearly opposite Lundy Island. The Cornish chough I was informed was not uncommon in that locality, and in a ramble along the cliffs towards Mort Point I observed a few of them, just near enough to recognise the species, and heard the cry of many more, which was something like that of the jackdaw, but

longer and more of a “squeal,” if I may use the term. A coast-guard man told me that he had shot many from time to time from the cliffs. On the steep slopes of Mort Point I observed a great many wheatears,—I expect just on the eve of departure,—and I also disturbed a large flock of curlews. Nearly the whole of Mort Point is one large rabbit-warren.

9th. Just as I was about to leave Barnstaple, Mr. Rickards, hearing of my being in the town, kindly called on me at the house of my friend, the Rev. W. S. Hore, bringing with him, for my inspection, the two pomarine skuas, of which he gave such an interesting account in the November number of the ‘Zoologist’ (S. S. 4240), and killed near Northam on the very day I was there. I was much gratified at being enabled to examine two such rare birds in the flesh. Mr. Rowe, gunmaker and animal preserver, of Barnstaple, informed me that many little stints, terns, knots, and some phalaropes, had been seen in the river during the month, and he showed me a young black tern lately killed in the neighbourhood.

23rd. A purple sandpiper was killed on the Breakwater; rather early for that species.

24th. Examined a young pomarine skua, in the flesh, which had been obtained at Altarnun, Cornwall, many miles inland.

Swallows and martins do not seem to have lingered so long with us this season. The last of either species noticed by me was about the middle of October: last year I obtained a few up to November. A friend of mine who paid a visit to the Scilly Islands early in the autumn told me that he found the rocks frequented by immense flocks of oystercatchers and a great many turnstones.

JOHN GATCOMBE.

8, Lower Durnford Street, Stonehouse, Plymouth.

Pimelepterus Cornubiensis, a supposed New Fish, at Penzance.

By THOMAS CORNISH, Esq.

THERE was taken in this Bay on Friday last, the 9th October, a fish which I believe to be altogether new in the British Seas, but the mode of its capture makes it doubtful whether it can be properly considered a British fish. The crew of the trawler ‘Ida,’ Captain Brown, when about six miles off land here, saw something afloat in the water. Nearing it, they found it was wreck covered

with barnacles, and which had, therefore, been a long time in the water. On getting it on board it turned out to be a box or packing-case, of which four sides and the bottom (it had been floating bottom up) were perfect, whilst the top had one board out of three torn off. In this box was found the fish. I afterwards found in its stomach remains of barnacles; and it is possible at least that the fish, finding its quarters comfortable and its food close at hand, may have floated with the box from the tropics along the currents which wash our western shores. When taken it was alive and healthy: it was kept alive for many hours in the trawler's big tub, but was dead when I saw it on Saturday last.

It is of the family Squammipennes (scale-rayed, the only member of which hitherto noted as British is, I believe, Ray's bream), but of its precise genus and species I must speak presently. It is fourteen inches and six-eighths long over all. The bases of the dorsal, anal and caudal fins are covered with scales half-way up the fin-rays, and there is consequently no proper fork at the tail, nor indeed any perceptible origin to the caudal-fin. The body fades away into it. The greatest depth of the fish is at the origin of the dorsal, four inches and four-eighths. Its greatest thickness is at the origin of the pectoral, one inch and seven-eighths. The head is rounded in a continuous curve from over the top of the operculum right down to the back of the gape of the upper jaw. The lower jaw shuts up to the upper obliquely, and is, when the mouth is shut, the shorter of the two, although when the mouth is open it looks the longer. There is in each jaw a single row of small distinct recurved teeth, all much of the same size; the palate is particularly smooth; the tongue free and smooth; the nose is very broad and blunt; the eye is over the end of the gape, large, round and prominent, just over half an inch in diameter, irides golden yellow; from the eye runs a gristle-white band straight forward to the nostrils, which are bilobed and conspicuous, the hinder one being the larger. The preoperculum forms a semi-acute curve at its lower extremity, and is slightly serrated along the curve and lower edge. The operculum ends in a soft membrane, and forms a conspicuous membranous point projecting backwards over the base of the pectorals. The pectorals are pointed, extend to under the origin of the dorsal, and contain twenty-three rays, all soft: there is a small dark spot at the upper base of them. The origin of the ventrals, which are connected

and covered with scales at the base, is under the base of the pectorals; they are short and pointed, and contain one spinous and five soft fin-rays, all bifid. The anal has one spinous ray (a very small one, barely more than rudimentary) and seventeen soft rays, commences close behind the vent, and ends quite clear of the tail under the end of the dorsal. The caudal is indented, but not deeply, and contains eighteen soft rays. The dorsal is peculiar: first come six small spinous rays, of which the fourth, which is the longest, is a trifle under three-eighths of an inch long, and to the top of each is attached a little fin, which ends at the base of the ray behind it, like a leg-of-mutton sail: this fin is not scale-rayed.* Each spine with its proper membrane falls back into a dorsal groove, but the spines are not so far apart from each other as they are long. After these spines comes one very short stout spine embedded in the base of the soft dorsal, which consists of twenty-two soft rays, all bifid. The lateral line follows the curve of the back, passing high over the pectorals and being well defined. The head is perfectly smooth and destitute of scales and covered with muciferous pores, and it (the head) was, when I first handled the fish, slimy to a degree. The body is covered with scales, which are ctenoid square, with the corners rounded, semitransparent with concentric lines, but not showing actual pectination on the outer edges under a magnifying power of sixteen: they are of various sizes, largest along the sides, especially the under side of the lateral line, and have the exposed edges speckled with very minute black spots: they lie very close to the body, so that the finger passes easily over them from tail to head.

I was told that the fish when first taken was bright-coloured. When I saw it, it was of a leaden blue, shot with purple over the back, and silver-white on the belly. The head was mottled with dark blue spots, disposed like the dark markings of a trout: a row of these in semicircle ran round the upper and hinder part of the orbits. The nose was gristle-white. From the vent there oozed a dark mauve-coloured fluid, and, as I have said, in its stomach were found remains of barnacles. The fish is under preservation for our museum here.

Seeing that the fish belongs to the family "Squammpennes," I am restricted in my search for its genus and species. Not being

* The next dozen words are taken from a description of the courpata (*Tetragonurus Cuvieri*), because they precisely describe the fin of my fish.—T. C.

able, from its dentition, to place it amongst the Chætodons (in which genus are two or three having somewhat similar spinous dorsals), I think it is most nearly allied to *Pimelepterus*, *Lacepède*, described by Cuvier (Anim. Kingd. ed. of Griffith and Hamilton Smith, 1834, vol. x. p. 177). Unfortunately, the books at my disposal here do not suffice for me to say whether it is a known species of this genus, but I feel tolerably safe in saying it has never yet been described as a British fish, and unless you, or some other person better informed than myself, can convict me of error, I should propose to call it *Pimelepterus Cornubiensis*. Its shape suggests a slow swimmer, and the size of its eye suggests that it is accustomed to deep water.

I have already hazarded a guess (S. S. 4242) that the green turtle very recently captured in the same waters was a waif astray from a recent wreck, but its occurrence so nearly about the time of the arrival of this box with the fish in it is remarkable, especially when we recollect that our shores here are undoubtedly washed by currents which come, more or less directly, from the Gulf of Mexico, and that in our seas tropical and Mediterranean fish are not uncommon, whilst large living turtle have been taken many times before.

THOMAS CORNISH.

Penzance, October 14, 1874.

Rare Birds at Eastbourne.—I have been fortunate in obtaining during this month a reeve and a dusky redshank; also a black tern and a little stint,—all these birds being considered rare in this neighbourhood.—*A. J. Clark-Kennedy; Eastbourne, September 21, 1874.*

Moulting Freak in a Robin.—Mr. Wigley, an intelligent owner of cage-birds, living in the Kent Road, has obligingly brought a favourite robin for me to examine, because he observed something very peculiar in its appearance after its autumnal moult: he has had this robin four years, and of course has nursed it through four moults; three of these have been conducted decently and in order, but the fourth has been exceptional; the two outside feathers on each side of the tail having moulted pure white, the others being reproduced of the usual colour. The red of the breast is of unusual brilliancy; the belly very white, and the usual band of bluish gray which surrounds the red of the breast is very distinct, but in no part except the tail is it other than a normally coloured bird in good plumage. We are accustomed to see white, or partially white, outside feathers in the tails

of buntings, pipits, larks, wagtails, and other passerines, and regard it as a matter of course, but why a cock robin should take this freak into his head, or rather into his tail, seems perfectly inexplicable.—*Edward Newman*.

Autumnal Migration of the Willow Wren, Swallow and Blackcap.—On the 7th of September the willow wren reappeared, and several were observed in the garden, and the following day numbers had collected and were to be seen in all directions, flitting from tree to tree in search of their insect-food,—seemingly abundant, particularly on the sycamore,—occasionally settling on the ground, within a few yards of me, in the most confiding manner. Morris remarks, quoting Meyer, that this species is common in North America; but this is a mistake, or I am greatly at fault, none having been observed by me during a year's residence in Canada, though an allied species, the blue-eyed yellow warbler (*Sylvia citrinella*) is abundant and widely distributed, having been met with in Newfoundland, in the stunted larch-woods on the barren hills near St. John's: this familiar and interesting species, whose brilliant golden plumage is so attractive to the wanderer, was described in my Canada notes as a true willow wren, though differing from *Sylvia Trochilus* both in shape and colour; it is a stouter bird, and of a more intense yellow; the flight is not so buoyant and graceful, but its habits are identical: the length, according to Wilson, is five inches; that of the European species, male five inches, female five inches and one-sixth, which is worthy of note, it being the only *Sylvia*, as far as I know, except the sedge warbler, of which the female exceeds the male in size. From an early hour on September 13th numerous swallows were seen, their line of flight to the eastward, the wind having veered to that quarter during the night, lowering the temperature some degrees: in one hour more swallows were seen than had been observed during the whole summer, and none bred here, and, what is more remarkable, no martin's nests are to be seen, where in former years they abounded; though the latter species is tolerably abundant, there has, as yet, been no flocking or assembling. Change of temperature has, I believe, notwithstanding the newly-broached theory as to light, caused this early flight, not to say migration, or I may be told that the swallow migrates in October; however, it could not have been "want of light" that caused this sudden move on the 13th of September, when we have the sun rising at 5.33 and setting at 6.18. On the 12th of October many swallows were seen sporting about as at midsummer, the thermometer being 60° at 9 A. M., and 68° at 1 P. M. in the shade. In the afternoon of the 14th several were seen, after a heavy shower, perched on the telegraph-wires, a favourite resort now. A writer in the 'Times' of September 18th wishes to know whether the male blackcap migrates before the female bird, as its moulting is completed two or three weeks earlier. Though I cannot answer the query, I would suggest that further observations be carried on, as the moulting of caged birds is uncertain, irregular, and not to be relied on, much depending on

the temperature and food. The writer also inquires what would become of the birds if liberated in the spring, when the "migratory fever" had set in, for if they were to go northward it would be beyond their "natural range." Their instinct would restrain them, being an unfailing guide, unless long caged, when the extent of flight would probably be to the first bush or garden-shrub within reach, without much regard to the points of the compass. Their restlessness up to the end of May might arise more from a breeding than a migratory propensity.—*Henry Hadfield; Ventnor, Isle of Wight, October 15, 1874.*

Late Breeding of Partridges.—The partridges have had very late broods this year. A gentleman out shooting near here, on the 9th of September, shot a single bird which rose in front of him, and then discovered that the bird had a family of twelve young partridges scarcely able to feed themselves; and while riding over the downs the previous week I saw two very young broods. As a rule, the birds this year are plentiful and very wild.—*A. J. Clark-Kennedy.*

Woodcocks in the Scilly Isles.—Up to this time thirty-five woodcocks have been shot at the Scilly Isles. The great autumnal flight seems to have passed over our Land's End district without their usual stop: a few scattered ones only have been seen.—*Edward Hearle Rodd; Penzance, November 11, 1874.*

The Kakapo, Owl-Parrot, or Night Parrot.—Three specimens of this strange bird were purchased last week by the authorities of the Zoological Society, and deposited in the Gardens; but as regards any pleasure or instruction they may afford the visitor of that establishment, they are likely to be of no more use than the kiwis are, and this may be estimated at zero. The owl-parrots are nocturnal; but many other animals now in the gardens are equally nocturnal, and yet it has never occurred to the Council to plant dense forests or construct deep caves in which they may be effectually prevented from seeing naturalists, and naturalists from seeing them. There is no occasion for this seclusion: Mr. Potts, who is thoroughly acquainted with the bird, says (S. S. 3623) that "all those who have kept a bird of this species as a pet agree in testifying to its intelligence and companionableness," and innumerable anecdotes told of a former captive of this species concur in representing it as peculiarly sociable, lively and amusing. We are therefore sacrificing the health and happiness of the bird, as well as the instruction and gratification of the public to a most untenable hypothesis, that it is good for him to be kept in the dark and in solitary confinement. Two out of the three recent acquisitions are confined in the condemned cell beyond the elands, the third is under the care of Goss, in the first cage on the right on entering the parrot-house, and he is furnished with a rabbit-hutch into which he may retreat on the least alarm, and in which it is just possible to see him by bending one's back until it is nearly

double. His size is large for a parrot, superior to that of owls in general, and almost equal to that of an eagle owl: the position in which I have seen him is rather horizontal; therefore he has little resemblance to Harrison Weir's well-known figure in Wood. The eye is the centre of what has been called a radiating disk, the feathers of which look stiff and bristle-like, and not at all like the feathers of the body and wings, which have a remarkably soft appearance; the tail seems to have been injured by confinement, and is not in good condition; but then, as to his colour, the late William Hunt, unrivalled as a painter of mossy backgrounds to his exquisite fruit and flower-pieces, never represented anything so beautifully mimetic as the kakapo; the imitation of moss is perfect, and of course serves to conceal him in his native haunts. I have not heard of his flying, indeed I could readily agree with Mr. Buller that he is totally unable to fly (S. S. 3085). Mr. Buller says, "All those who have studied the bird in its natural state agree on this point, that the wings, although sufficiently large and strong, are perfectly useless for purposes of flight, and that the bird merely spreads them to break the force of its fall in descending from a higher point to a lower when suddenly surprised; in some instances even the use of them is neglected, the bird falling to the ground like a stone." I cannot find that either Mr. Buller or Mr. Potts, our two highest authorities on the birds of New Zealand, ever speak of having observed the bird in a wild state. When disturbed and compelled to evacuate his hutch for a moment, he runs back again with a shuffling and rapid motion, and immediately regains the site from which he was removed; this running is in a horizontal position, as though he were threading one of those meuses which are described as abounding in his retreats. In a state of nature the kakapo is said to eat a large quantity of moss, and Mr. Potts says that it feeds also on the tender shoots of *Schefflera digitata*, and on the young fronds of ferns, especially *Asplenium bulbiferum*, and speaks of masses of chewed fibre from which the nourishment has been abstracted occurring in its meuses. If the kakapo really chews its food it is a characteristic of bird-life quite new to me. At the Zoo he is offered monkey-nuts and maize, interspersed occasionally with other dainties; but we may yet hope to learn something more of his food, as also of his ways and his manners.—*Edward Newman*.

***Didunculus strigirostris*.**—This rare bird, a native of the Samoan Islands, continues in apparent good health, but I believe is only deposited in the care of the Society at present: it would be a valuable acquisition to the collection if the Council of the Zoological Society are able to obtain it by gift or purchase.—*Edward Newman*.

Greater Shearwater on the Cornish Coast.—We have these birds with us again this autumn, but I have not observed any for some years previously on our coasts. Two I have just examined are in the same state of plumage as they mostly appear in, *viz.* light ash-coloured brown above, with lighter

borders to the dorsal feathers, and underneath pure white, with the exception of an oblong brocoli-brown blotch on the centre of the belly about the size of the palm of your hand. This would give an idea of its being the last remnant of immature plumage, if the dark chocolate-coloured specimens are young birds; but I hesitate to say that it is so, after the opinion of Mr. Gould that this dark plumage is only indicative of a variety in old and young birds.—*Edward Hearle Rodd.*

Greater Shearwater on the Coasts of Devon and Cornwall.—After an almost entire disappearance for many years, I am glad to say that the greater shearwater, or "hackbolt," has again visited the coasts of Devon and Cornwall in some numbers, as I had the pleasure of examining three specimens, in the flesh, obtained off Plymouth on the 6th of November, and the next day two more out of four that were captured off Penzance. The five birds that were examined by me appeared rather smaller than usual, and were all in precisely the same state of plumage, apparently adult, with the exception of a longish patch of dark brownish gray on the centre of the belly. On former occasions, when the autumnal visits of this species were more frequent, many young birds in their first *dark* plumage (similar to one of Yarrell's figures) were obtained, but as yet I have not heard of any in that stage having been taken. The birds brought to Plymouth were, on dissection, found to be exceedingly fat and oily.—*J. Gatcombe; Nov. 17.*

An escaped Pelican killed at Faversham.—On the 10th of October a pelican was killed at Faversham by a coast-guardsmen: it was in beautiful plumage, and exhibited no signs of confinement. On reading the report, Mr. Arthur Reeve, the manager of the Zoological Gardens at Margate, stated that a pelican flew from its pen in these gardens on Sunday, the 25th September: there can be little doubt that this was the same individual.

Little Gull near Shrewsbury.—A bird of the year of this species was killed recently near Shrewsbury, and forwarded to me for preservation.—*John Shaw; Shrewsbury.*—*'Field,' October 31.*

The Penguin at the Zoo.—I may truly say it is one of the greatest pleasures of my life to visit any newly-arrived animals at the station where they are exhibited to public inspection for public instruction: whether such station go by the name of "garden," "vivarium," or "aquarium," matters but little. I like to watch them, to observe what they do, how they eat, drink, make love, and so forth. Naturalists have different proclivities, and these proclivities have inaugurated three distinct schools: the first school aims at rectifying the names; the second school brings compasses and a graduated rule to take measurement of the dried skins; while the third, or life school, cares only for what the animal does when allowed as much liberty as is consistent with his safe custody. Each school has its advantages, and the eventual union and amalgamation of the three may subserve a useful purpose: at present they are completely distinct.

I give in my adhesion to the last or "life school"; and therefore the acquisition and exhibition of a living penguin was a great treat, a red-letter day in my Natural-History calendar; in a word, to me it was a joy unspeakable. When I first saw him he was standing almost erect, as, according to books, penguins ought to stand: he was in the inner division of his compartment in the Eastern Aviary, and was making a tripod of himself, using his stumpy tail as a third leg: he had a most disconsolate air,—much that of a persecuted puppy compelled against his will to stand on his hind legs,—his fore legs, or wings, or flappers, dangling helplessly on either side: on a careful examination I found he was resting on the entire length of his tarsi, but I have since seen him standing on his feet only, so that I must decline to lay down any law as to what he ought to do. While I was waiting for him to solve the question he fell plump down on his stomach, and immediately commenced swimming with his flappers in such a violent manner that I thought he must have broken or injured them, seeing that swimming in the air or on the unyielding surface of his prison-house, was, to say the least, an unsatisfactory and unremunerative mode of progression. On the occasion of my next call (it was on the 31st of October), he received me in the pelican's enclosure. He was standing on the edge of the circular tank in which the pelicans daily exhibit their piscatory feats to a select but highly appreciative audience. His manner now evinced great prostration of strength; his eyes were half-closed, and that laboured rhythmical panting which all bird-keepers recognise as the infallible precursor of approaching dissolution was unmistakably present. But the end was not so very near after all: life was still vigorous within him; for almost as soon as he saw the keeper Church, who entered with me, bringing a cold collation of living gudgeon, he once more fell plump on his stomach, and then, with a very seal-like movement, jerked and wriggled himself into the water. Here he seemed perfectly at home: on dry land he was evidently out of his element, wretched, helpless, dejected, ill, dying; in the water, vigorous, full of life, activity, and apparent health. I must confess I was disappointed not to see him turn on his back like a seal, but there is no occasion for this; he need not, like a seal, be ever on the look out for enemies by land, and therefore his eyes are in the usual bird-position. Directly he had launched himself into the water he ceased in all appearance to be a bird; his head and neck assumed the similitude of the same parts in some long-necked water-tortoise, possessing the same perfect freedom of motion, turning right or left as the frightened little fishes thrown in for his special delectation darted in either direction. It was evident he pursued them with wide-open eyes, for he followed them with precision and skill, notwithstanding the somewhat cloudy condition of the water: he caught them with ease and dexterity, sometimes by the tail, but generally crosswise with the beak, and if so, the position was

almost instantaneously rectified and the victim swallowed head foremost. The wings are used exactly as a turtle uses its anterior flappers; indeed when the penguin is enjoying his subaqueous flight round and round his limited tank, in pursuit of a gudgeon, the motion of his wings is identical with that of the flappers of a turtle, as I have seen them exhibited in the Aquarium at Brighton. The penguin under water may be not inaptly compared to a turtle which having lost its posterior flappers by some accident, was allowing the anterior pair to do the work of all four: a disciple of Lamarck would without hesitation affirm that the remaining pair had obviously increased in length and strength in order to meet the increased duties that had devolved on them in consequence of the casualty. Then, as to the legs, they are stout and strong, but appear even less adapted to aquatic than to terrestrial progression; in his subaqueous flight the penguin holds them straight behind him and close together, the tail, as in the seal, alone intervening, and legs and tail forming a truncated termination to the seal-like body, which is drawn after the flappers, without any motion of legs or flexion of the spine; of course the ornithic arrangement of bone would render such flexion impossible. I trust the time may be approaching when we shall have the opportunity of watching the subaqueous movement of all animals whose home is the ocean; and that the projectors of the Aquarium at Westminster will shortly exhibit porpoises, grampuses, dolphins and turtles, utterly regardless of all considerations but the healthy condition of their prisoners, and, as a consequence, the remunerative character of their spirited undertaking. The poor penguin verified my prognostication of his fate by dying on the 3rd of November: on examination his viscera were found to be much diseased.—*Edward Newman.*

An Angler or Fishing Frog at the Manchester Aquarium.—Mr. Saville Kent, who has just received from Colwyn Bay, a living specimen of this peculiarly objectionable-looking fish, has thus described his acquisition in the 'Field Newspaper' of November 14th:—"He lay like a huge toad, or rather the very embodiment of some hideous gnome or other demon of rapine and darkness. A more flattened, repulsive-looking, low-typed head—and the animal is all head—than that of this fish scarcely exists, with its extraordinary development of lower jaw, armed with threatening rows of recurved teeth, its close-set eyes, and the numerous rugged ridges and protuberances with which its surface is beset. Nevertheless, as in all other instances, associated with the master hand of Nature, a closer contemplation of this, at first sight, repulsive-looking fish leads us gradually to substitute feelings of wonder and amazement for the earlier ones of aversion and repulse, until our minds at length become lost in admiration at the beautiful adaptation to a fixed purpose exhibited throughout its entire construction. Thus, though

a few days only have yet elapsed since the arrival of our specimen at Manchester, the favourable opportunities of watching its habits and studying its form have already elicited data scarcely to be obtained except by the observation of a living fish. Commencing with generalities, one of the most striking features that first attracted my notice in this specimen was the remarkable likeness of the animal's head to a mass of rugged rock—the irregular outline formed by the prominent ridges of its upper surface, and the excessive projection of the massive lower jaw, especially favouring this simile. Following up the idea still further, the illusion was found to be carried out to an extent altogether marvellous to contemplate. This prominent lower jaw in itself formed a natural rocky ledge springing from the parent mass. Along its lower margin are dependent, in the most highly developed state, those singular lobulate processes which extend in a straight line backward to the creature's tail. The size and shape of these processes vary considerably, though generally following a more or less leaf-like contour, and one between every two or three being much longer than its neighbours. As far as I am aware, no attempt has yet been made to explain the purpose or function of these appendages; but to one accustomed to hunting for marine treasures at low tide on a rocky coast line, their resemblance to the small flat calcareous sponges (*Grantia compressa*), ascidians, zoophytes, and other low invertebrate organisms which fringe the lower margin of every conspicuous ledge, is strikingly suggestive. The next point we arrive at is the wonderful apparatus upon its head, with which the animal has been supposed to lure on its prey to destruction. It consists of two erectile filaments, the foremost of which is produced at its extremity into a membranous digitiform expansion. According to the books, this expanded membrane owes its especial attractive qualities as a bait to fish in its vicinity to the glittering metallic colours which play upon its surface. As far as I can ascertain, however, by both personal observation and that of others, no such distinctive colouring really exists, the membrane sharing the sombre hues of the general surface of the body. Following out our rock simile, these organs yield another point remarkably favourable thereto; the foremost filament, with its digitiform membrane, is the facsimile of a young frond of oar-weed (*Laminaria digitata*) in both shape and colour; and in the tendril behind it we have a repetition of the same with the blade of the frond, as it were, worn away by the current of the ocean. Our rock, however, is not yet clothed with all the growths that contribute to perfect its mimicry of nature; for where we might least expect it—that is, in the animal's eyes—we find the most extraordinary mimicry of all. These organs are very large and prominent, the iris being conical in shape, of a yellow ground colour, with longitudinal stripes of a darker shade, while the pupil, commencing abruptly at the summit, is of so jetty a hue that the aspect of the whole is that of a hollow truncated cone, resembling, with its longitudinal stripes, the deserted

shell of an acorn barnacle, and with an amount of exactness that is apparent to the most ordinary observer. We have here in this fish, then, the most perfect possible embodiment of a rocky boulder, with its associated animal and vegetable growths. Lying prone at the bottom of the ocean among ordinary rocks and *débris*, it might well pass muster as an inanimate object, and the other fish on which it preys would approach it with impunity, and never discover their mistake until too late to escape from its merciless jaws. Ensconce the animal snugly, however, in the crevice of some precipitous submarine cliff, and the illusion is more perfectly complete. No strategy need now be exerted by the voracious fish to attract his prey; he has only to lie close and quiet, letting his tendrils sway to and fro in the passing current like the weeds around him, and the shoals will approach, browsing the vegetation, or pursuing their crustaceous diet right into his very mouth. And that such surroundings as the foregoing are most congenial to the angler's tastes is abundantly evinced by the habits of the specimen in the Manchester Aquarium. He is ever slinking off to the rockwork, and establishing himself so closely in some snug corner that it requires, notwithstanding his large size, a considerable amount of diligent search to detect him."

Ray's Bream near Penzance.—On the 10th of July last a specimen of Ray's bream (*Brama Rayii*) was found nearly dead on the beach near this place. It is remarkable of this fish, I believe, that it has never yet been taken unless in this way. It was brought to me, and is now set up for our museum.—*Thomas Cornish; October 14, 1874.*

Pilot-fish at Plymouth.—Yesterday two beautiful specimens of the pilot-fish were brought to me for identification by a young sailor who had caught them with his hands from off a yacht, he said, in the Great Western Docks, Plymouth. I believe numbers of this species sometimes follow ships into our harbours.—*J. Gatcombe; November 10, 1874.*

King Crabs at the Crystal Palace Aquarium.—The Aquarium has obtained a dozen fine king crabs (*Limulus Polyphemus*): this is a great acquisition, but they are by no means so interesting as could be wished. After all Mr. Lloyd's experience at Hamburgh, as recorded in a former number of the 'Zoologist,' he does not seem to have instructed his attendants how to feed king crabs for the gratification of his visitors. I long to see them use that strange mouths of theirs, which seems to be composed entirely of legs, and not to be a mouth at all, except by courtesy. Food is provided in plenty, and the attendant tells me it sometimes disappears, but if so, like the banquets provided of old for the Egyptian gods, it is disposed of when the backs of visitors are turned.—*Edward Newman.*

The Zoological Society's Gardens in the Regent's Park.—The additions to the collection of the Zoological Gardens since my last notice are as under:—

Published 29th October.—A Bengalese leopard cat (*Felis bengalensis*) and a common paradoxure (*Paradoxurus typus*) from India, presented by Capt. W. Reynolds; an eagle owl, European, presented by Lord Londesborough; a fruit bat (*Pteropus medius*) from India, presented by Dr. Stafford; a Monteiro's Galago (*Galago Montei*) from Angola; a toothbilled pigeon from the Samoan Islands, deposited; two Geoffroy's doves (*Peristera Geoffroyi*) from the Island of Fernando de Noronha; and a Gentoo penguin (*Pygosceles taniatus*) from the Falkland Islands. The toothbilled pigeon or Manumea and the Gentoo penguin were mentioned in a note of my own in the November 'Zoologist.' The penguin died on the 3rd of November (see S. S. 4264).

Published 5th November.—A Bonnet monkey (*Macacus radiatus*) from India, presented by Mr. S. T. Hughes; a blackbacked piping crow (*Gymnorhina leuconota*) from South Australia, presented by Mr. F. Fuller; a speckled terrapin (*Clemmys guttata*) from North America, presented by Mr. A. B. Duncan; a white stork and two thicknees, European, deposited.

Published 12th November.—A Nisnas monkey (*Cercopithecus pyrrhonotus*) from Nubia, presented by Dr. R. F. Mayne; a Bengalese leopard cat (*Felis bengalensis*) and an Egyptian cat (*Felis Chaus*) from India, a Leadbeater's cockatoo from Australia, deposited; a pair of barheaded geese (*Anser indicus*) from India, and three night parrots (*Stringops habroptilus*) from New Zealand, purchased. These last-named birds form the finest collection of the species ever seen in this country (see S. S. 4260).

Proceedings of Scientific Societies.

ZOOLOGICAL SOCIETY OF LONDON.

November 3, 1874.—Dr. A. GÜNTHER, F.R.S., V.-P., in the chair.

The Secretary read a report on the additions that had been made to the Society's Menagerie during the months of June, July, August and September, 1874, and called particular attention to a pair of Arabian gazelles (*Gazella arabica*) from Aden, presented by Mrs. Benecke, July 25th; two specimens of a remarkably large skink (*Macroscoincus Cocteauui*) found in Ilot Blanc, one of the smaller islands of the Cape de Verd group, presented by Professor Barboza du Bocage, August 14th; and a one-wattled cassowary (*Casuarus uni-appendiculatus*), obtained in New Guinea, and presented by Captain Maisby, R.N., of H.M.S. 'Basilisk,' August 25th.

Mr. Selater gave an account of some visits he had recently made to several Zoological Gardens and Museums in France and Italy, and made remarks upon some of the principal objects noticed therein.

Mr. G. Dawson Rowley exhibited, and made remarks upon, some rare birds from New Zealand, amongst which were fine examples of *Apteryx Haasti*, and a living pair of *Sceloglaux albifacies*.

Mr. Wallace exhibited some rhinoceros horns, obtained in Borneo by Mr. Everett, proving that this animal was still found living in that island.

Mr. Gould exhibited a drawing of a new parrot, of the genus *Aprosmictus*, recently obtained on the Darling Downs, in Queensland. Mr. Gould proposed to call this bird *Aprosmictus insignissimus*.

A letter from Mr. Swinhoe was read respecting some bats obtained by him at Ningpo.

A communication was read from M. L. Taczanowski, Conservator of the Museum at Warsaw, in which he gave a list of the birds collected by M. Constantine Jelski, in the central part of Western Peru. Amongst these were eighteen species described as new to Science.

A communication was read from Mr. Frederick Moore, giving descriptions of some new Asiatic Lepidoptera.

A communication was read from Mr. G. Gulliver, containing measurements of the red corpuscles of the blood of the hippopotamus, of *Otaria jubata*, and of the walrus.

Mr. R. Bowdler Sharpe read a paper entitled "Contributions to a History of the Accipitres or Birds of Prey." The first of this series contained notes on the females of the common and South African kestrels.

A communication was read from Mr. Henry Adams, giving descriptions of some new species of shells from various localities, also of a new genus of bivalves from the Mauritius.

Mr. A. H. Garrod read a paper on points in the anatomy of the parrots which bear on the classification of the sub-order. This memoir was based upon the examination of a large number of individuals belonging to seventy-nine species, chiefly from the Society's living collection, and contained a new arrangement of the group, based principally upon the arrangement of the carotid arteries, and the presence or absence of the ambiens muscle, the furcula and the oil-gland.

A communication was read from Mr. G. B. Sowerby, jun., giving the descriptions of five new species of shells from different localities.

A communication was read from Mr. E. P. Ramsay, wherein he described five new species of Australian birds, and of the egg of *Chamydodera maculata*. The birds described were *Cypselus Terræ-Reginæ*, *Ælurædus maculosus*, *Ptilotis frenata*, *Eopsaltria inornata*, and *Rhipidura superciliosa*.



